Teaching by Television

A Report from The Ford Foundation and

The Fund for the Advancement of Education

Teaching by Television

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Preface

The beginning of a new era in American education may well be marked by the experiments described in this report.

These experiments involve the use of television—not occasionally, not as an educational "extra," but regularly, as a basic part of the daily instruction.

Supported in part by the Fund for the Advancement of Education and the Ford Foundation, the experiments represent a search for better ways to teach the nation's growing student population and to make available to these young people instruction of a higher order than they might otherwise receive.

The use of television for this purpose may still be novel. Yet the experiments described in this report involve more than twenty-five colleges and universities, 100 school systems, and, in the present academic year, more than 100,000 students and their teachers.

To be sure, the tested experience with television for regular instruction is relatively brief. Few of the experiments date back more than three years, many no more than one. This progress report will not describe in detail all the experiments supported by the Fund and the Foundation, but rather will attempt to summarize what has been done and what has been learned to date.

A list of the schools and colleges that have undertaken classroom television experiments with Fund or Foundation support is in Appendix I, together with the names of the persons who can supply further information.

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The Picture in Perspective

A distinguished professor once remarked that it took about fifty years for a new idea to gain general acceptance in American education. A few years ago not many educators would have quarreled with that assertion. During the past four or five years, however, there has been a restless stirring in the nation's schools and colleges. This ferment has taken the form of a questioning of accepted practices, a challenging of long-held concepts, and a search for new and better ways of going about the job of providing a better education for the nation's young people.

In part, this ferment has been stimulated by the unprecedented increase in the number of boys and girls to be educated. Since the end of World War II, the number of births has risen more than fifty per cent, and each year for the past five years it has hovered around the four-million mark, which is one and one-half times the level of the depression decade of the thirties. Enrollments have risen steadily at all levels of education, and as wave upon wave of new students have swept upward through the grades, educators have come to realize that this is not a temporary phenomenon, but a problem—and a challenge—that will be with us for the foreseeable future.

Coupled with the rapid rise in enrollments has been an acute shortage of able teachers. Since the end of the war, the number of new college graduates entering teaching has not kept pace with the number of teachers leaving the profession, and the number of poorly qualified teachers hired each year has remained distressingly high. This shortage of well-qualified teachers has now edged its way up to the college level, where

the number of new faculty members with a Ph.D. is declining steadily while the number of new faculty members with less than a Master's degree is rising at a corresponding rate.

The combination of a growing number of students and a shortage of able teachers has spurred many thoughtful educators to seek new ways of multiplying the effectiveness of the *good* teachers that are available at the school and college level lest a whole generation of young Americans be shortchanged in their education and, in turn, shortchange future generations when they themselves become teachers.

Two other factors that have helped to bring about a search for new approaches in education have been a dramatic increase in the range of knowledge today's students will have to acquire in order to live intelligently in the space age, and a similar increase in the complexity of the new things to be learned.

Some observers would argue that the greatest spur for improvement in American education came in the fall of 1957 when Soviet scientists launched, in quick succession, the first man-made satellite and the first passenger-carrying satellite. But actually the ferment was already under way. Sputnik and Laika merely accelerated the trend.

The past few years have brought a wave of bold and imaginative experimentation—in new ways of attracting a higher proportion of top-quality people into teaching, upgrading the teachers already on the job, extending the reach of superior teachers, making more effective use of time and space, challenging able students, and arranging the curriculum so as to put greater stress upon the new body of knowledge.

One of the most promising tools for attacking many of these problems has been television, the most powerful medium of communication yet devised by man. Commercial television burst upon the American scene shortly after the end of the war, and its growth since then has been nothing less than phenomenal. Ten years ago, there were only a few thousand receiving sets in American homes. Today there are more than fifty million. (A recent survey showed that more homes had TV sets than bathtubs.) Commercial television has done more

to influence American culture in the past decade than any other medium of communication. For better or for worse, it has also had a tremendous impact on the education of American children.

The direct educational value of the new medium was recognized early, and the Federal Communications Commission set aside some 250 channels for educational purposes. The Fund for Adult Education, established by the Ford Foundation in 1951, immediately took steps to help local communities establish educational stations. Through a series of matching grants, it was instrumental in the activation of about thirty of these stations. It also made possible the establishment of the Joint Council on Educational Television and the Educational Television and Radio Center.

Now only about six years old (the first station, KUHT at Houston, began operations on May 25, 1953), educational television has grown almost as fast as commercial television. As of this writing, there are thirty-nine educational stations in operation and a dozen more under construction. In addition, a recent survey by the Joint Council on Educational Television and the American Council on Education indicated that there are more than 150 closed-circuit installations in schools and colleges throughout the country, and that closed-circuit television is being used for instruction and training at twenty-one military installations.

Educational television, in its broadest sense, includes all programs of an educational or cultural nature that are broadcast over educational stations. *Direct instruction by television,* with which this report is concerned, refers only to the use of television by schools and colleges to teach courses for credit. Perhaps a more concise term would be "televised instruction."

Pioneers in the use of television as a medium of instruction were a few Midwestern universities, including Western Reserve and Iowa State, which first began to offer televised courses for credit about six or seven years ago. The armed services also realized the potential of the new medium, and began to use it extensively for instruction and training purposes. Medical and

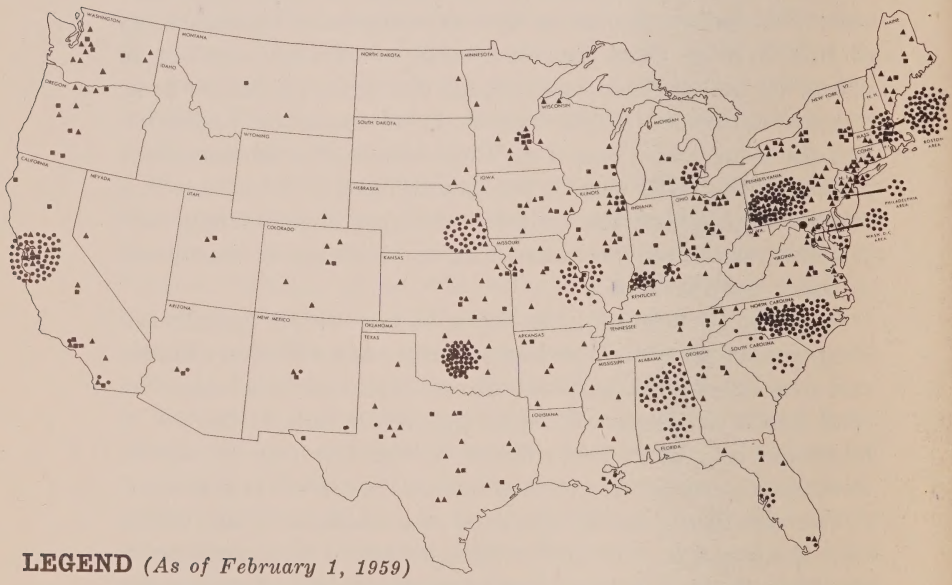
A Word About the Map

This map purports to show the status of televised instruction in schools and colleges as of February 1, 1959. Actually, it is inadequate in two respects. To begin with, no fact-gathering agency has accurate and up-to-date information about this brand new aspect of American education, so there are undoubtedly many schools and colleges currently making regular use of televised instruction that do not appear on the map. Secondly, the situation is changing so rapidly that the map probably will be out of date by the time it reaches the readers of this report.

The significance of the map lies in the fact that six years ago it would have contained only about a half-dozen widely-scattered dots.

(For a list of schools and colleges which the various dots represent, see Appendix II.)

Schools and Colleges Using Television as a Medium of Instruction



LEGEND *(As of February 1, 1959)*

- ■ Colleges and Universities Offering Television Courses for Credit (Total: 117)
- ▲ Colleges and Universities Offering Credit for "Continental Classroom" (Total: 241)
- ● School Districts Making Regular Use of Televised Instruction (Total: 569)

dental schools in several universities soon discovered that television could provide every student a "front-row seat" in observing complicated surgical and dental operations and quickly adopted the new medium as a teaching tool. One of the earliest experiments at the school level took place in New Jersey in the spring of 1954, when fifth-grade students in the Red Bank and Long Branch public schools viewed a two-week series of televised lessons in American history that had been prepared by six teachers under the supervision of the New Jersey State Teachers College at Montclair.

The extent to which the use of television for direct instruction of school and college students has grown in the past six or seven years is shown on the accompanying map.

Although no accurate figures are available as to the number of school and college students receiving part of their instruction over television this year, a conservative estimate would place the number at well over half a million. Practically every course in the school and college curriculum, from first-grade arithmetic to college zoology, is being taught somewhere over television.

Television's unique advantages as a medium of instruction are: first, it can vastly extend the reach of the nation's best teachers; and second, it can bring to students educational experiences that are quite beyond the potential of conventional means of instruction. Not long ago, for example, fifth-graders in the Pittsburgh public and parochial schools had an opportunity to see and hear Robert Frost read some of his poems over television. The experience these youngsters had was quite different from the experience they might have had in a conventional poetry class. They were not reading Robert Frost's poems from a book, nor were they listening to their teacher read them. They were seeing and hearing the poet himself. This difference in experience might not show up on a standardized achievement test, which is designed to measure the subject-matter content mastered by a student in a given course, but it was nevertheless real.

When television first began to be used for direct classroom instruction, many questions were raised about its role in education. There were some who took a dim view of its potential. It was argued, for example, that television was essentially a one-way medium of communication and that its use for instruction would deprive the student of valuable contact with the teacher. As one critic put it, "an electronic tube cannot understand a child." It was also argued that learning would be reduced to a passive experience in which the student merely soaked up what was presented by way of a flickering image on a screen. Finally, of course, it was argued that "television will never replace the teacher."

What most of these arguments overlooked was that television is not a teacher, but merely a conveyer of teaching, and that a good teacher on television can be much more effective in stimulating *learning* than a mediocre teacher in the intimate environment of a classroom.

As teachers became more familiar with television as a medium of instruction, much of the early opposition evaporated. It soon became evident that television, far from being a threat to the status and prestige of the classroom teacher, was actually a powerful new tool for enhancing the art and prestige of teaching and for bringing to the student richer, broader, and deeper learning experiences.

The Fund for the Advancement of Education took an early interest in the possibilities of the medium for helping to meet important educational problems, and particularly the problem posed by the growing number of students and the continuing shortage of able teachers. During the past five years, the Fund and the Ford Foundation have provided financial support amounting to more than ten million dollars for more than fifty different experiments at the school and college level involving the use of television as a medium of instruction. Each of these experiments has been aimed at exploring the potential role of television as an instrument for improving the quality of education.

The primary focus of these experiments has been on multi-

plying the effectiveness of able teachers. Following are a few illustrative examples:

☐ At Pennsylvania State University and at Miami University, in Oxford, Ohio, closed-circuit television is being used successfully in the required freshman and sophomore courses, which traditionally enroll the largest number of students. At both institutions, it has been found that this method of handling large classes is not only educationally sound but also economically feasible.

☐ At the University of Detroit and Chicago Junior College, open-circuit television is being used to bring the major portion of the freshman and sophomore curricula to students off campus.

☐ At San Francisco State College, and at other institutions, college-level courses are being televised to able high-school students for credit.

☐ In Oregon, four colleges and universities have been joined together in a closed-circuit television network, and outstanding teachers from each campus have been made available to the students at all four institutions.

☐ At the University of Minnesota, closed-circuit television is being used to enable student teachers, without being physically present, to observe teaching and learning situations in a classroom.

☐ In Texas, the facilities of a state-wide network of commercial stations have been made available to the state department of education for reaching beginning teachers with a series of lecture-demonstrations designed to start them on the road to permanent certification.

☐ In Nebraska and Oklahoma, open-circuit television is being used to bring to students in small rural high schools college preparatory courses that otherwise would not be available to them because of the lack of qualified teachers.

☐ In Alabama, an educational-television network is being used to bring high-quality instruction to 16,000 students in 222 elementary and secondary schools throughout the state.

☐ In southwestern Indiana, sixteen school systems center-

ing around Evansville have banded together to form an educational-television council, which, financed out of a common treasury, makes available to students in each school system the combined teaching resources of all.

☐ In Washington County, Maryland, a closed-circuit television network that eventually will link up all forty-eight schools in the county is being used to bring daily instruction in thirty-nine courses—at all grade levels—to nearly 18,000 students.

☐ In more than a dozen large cities throughout the country, television is being used as a major resource in the teaching of classes several times the size of conventional classes.

☐ In New York City, closed-circuit television is being used in a low-income housing project to bring the school and the community closer together and to help overcome the language barrier between English-speaking and Spanish-speaking children.

☐ Over the nationwide network of the National Broadcasting Company, a course in modern physics is being taught each weekday morning to what may well be the largest "class" in the history of American education, numbering nearly 270,000 high-school teachers, school and college students, engineers, housewives, and others to whom education represents a continuing process. Since the experiment marks the first time that a full college course is being televised on a nationwide basis, this course is appropriately called "Continental Classroom."

Although it is much too early to draw any final conclusions about television's ultimate role in education, the results of the experimentation to date have been very encouraging. These results show, among other things, that students at both the school and college level learn as much—and in some cases significantly more—from televised instruction as from conventional instruction. The usual finding from most of the experiments has been that there is no significant difference in achievement between students in television classes and comparable students in regular classes. This finding is in itself remarkable, in view of the newness of television as a medium of instruction, the relative inexperience of those who have been using it, and the fact that existing school and college classrooms as well as

existing television equipment were not designed for televised instruction.

Results from two of the most extensive school experiments—although still tentative—indicate that superior teaching over television stimulates much better learning on the part of the student than ordinary teaching in the classroom. This has been particularly true when the "team" approach to teaching has been employed—when studio teachers and classroom teachers have pooled their skills and each has undertaken that particular part of the total teaching job to which the individual teacher is best suited by interest, ability, and temperament.

The two experiments where this method of teaching is producing results superior to conventional methods are the Washington County, Maryland, project, involving some 18,000 students in the county schools, and the National Program in the Use of Television in the Public Schools, a nationwide project involving in its first year nearly 40,000 students in more than 100 public-school systems throughout the country.

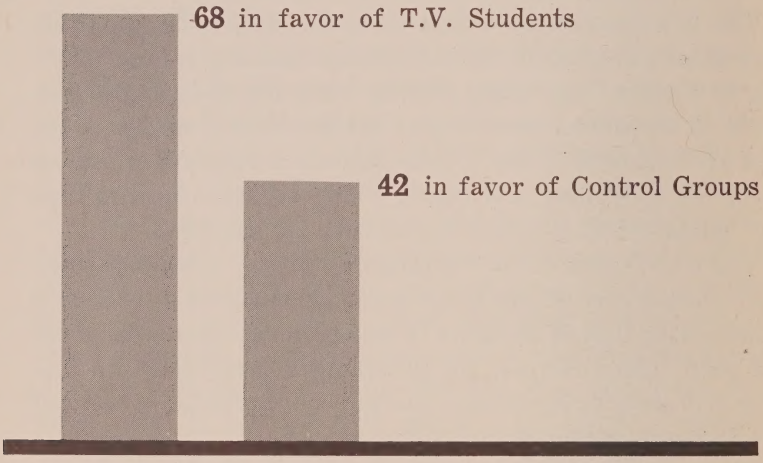
The test results from Washington County, based on a two-year comparison of the achievement of students in television classes with that of students in conventional classes, have not yet been fully analyzed, but preliminary indications are that they will show an impressive margin of superiority in favor of the students in the television classes.

The results of the first year of testing in the National Program are shown on the chart on page 10. Out of 110 different kinds of comparisons involving a combined total of 14,326 television students and 12,666 control students of equal ability, sixty-eight comparisons favored the television students and forty-two favored the control students. In thirty-eight of these cases, there was a statistically significant difference in the achievement of students in the two groups—that is, a difference that could not reasonably be attributed to chance. Of these statistically significant differences, twenty-nine were in favor of the television classes and nine were in favor of the control groups. According to the laws of probability, the chances of

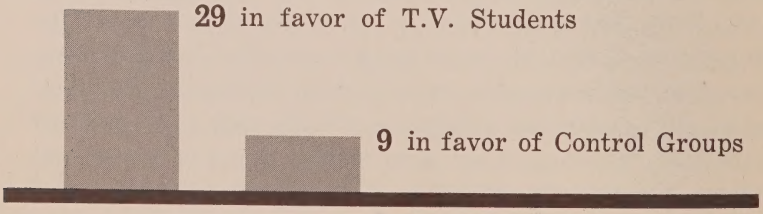
THE NATIONAL PROGRAM IN THE USE OF TELEVISION IN THE PUBLIC SCHOOLS

Test Results For The First Year

Number of Comparisons Favoring T.V. Students and Number Favoring Control Groups



Significant Differences in Achievement



such a result happening purely by accident are only five in a thousand.

Other encouraging results have emerged from the experimentation. For example, it has been found that televised instruction requires the student to accept more responsibility for his own learning than is the case with conventional methods of instruction. Also, students in television classes at the elementary and secondary level make more extensive use of the school library than students in regular classes.

In addition, experience to date has shown that the "team" approach to teaching, particularly at the elementary and secondary levels, opens up exciting new possibilities for capitalizing on the varying teaching skills among teachers in any given school system. Televised courses have been much more carefully planned and organized than conventional courses, and the combination of the skills of the studio teacher and of the classroom teacher has made possible a cooperative teaching effort far better than either teacher could achieve alone. At the elementary and secondary levels, for example, the usual practice has been for the studio teacher to "meet" only one class a day, generally for twenty or thirty minutes. The teacher then has the rest of the day to plan tomorrow's lesson. This opportunity to plan carefully, combined with the unique possibilities that television affords in the presentation of visual materials that reinforce learning, has stimulated the studio teachers to do a much better job of teaching than they had done in their conventional classes. In the meantime, the classroom teachers, relieved of the burden of planning and presenting the principal material in several different subjects during the course of a day, are free to concentrate on other important aspects of teaching—such as eliciting student participation, answering questions, leading discussions, reinforcing when necessary the main concepts presented in the telecast, providing individual help where needed, and stimulating the students to do something with what they have learned. Studio teachers and classroom teachers who have mastered the techniques of the "team"

TEAM TEACHING IN TELEVISION CLASSES

1. The studio teacher, classroom teachers, and curriculum specialists cooperatively plan the course in advance and prepare teacher guides.

2. The studio teacher presents, explains, and demonstrates the major points of the lesson, raises questions, and stimulates student interest.

3. The classroom teacher prepares students for the telecast part of the lesson, answers questions, clarifies points, leads discussion, makes assignments, gives individual help, and supervises testing.

4. The studio teacher and classroom teachers confer regularly to evaluate the lessons and make improvements.

approach say they greatly prefer it to the conventional method of teaching.

One other important result of the experimentation to date has been a more effective use of teaching time and classroom space. This has been especially true in the elementary and secondary schools, where the shortage of teachers and classrooms is most acute. Several school systems, notably those of Dade County, Florida, and Washington County, Maryland, have found that the use of television in teaching large classes has enabled them to serve more students with the able teachers already on their staffs and to get along with fewer new teachers than they otherwise might need. This means that they can be much more selective in hiring new teachers. The use of auditoriums, cafeterias, and other large rooms for certain television courses also has meant a substantial saving in classroom space.

Several other school systems have used the teacher time saved by the use of television in large classes to establish much smaller classes than usual for slow learners and for rapid learners, and to provide overworked classroom teachers with one or more free periods during the school day.

Finally, the use of superior teachers on television has proved an important means of upgrading the quality of other teachers, particularly beginning teachers. Several superintendents have reported that television has brought a system-wide improvement in teaching, and that even some of their best teachers have learned new techniques by observing the studio teachers.

There also have been problems.

One of the biggest single problems at the elementary and secondary level has been that today's schools were not designed for instruction by television, especially in large classes.

Another major problem at the elementary and secondary level—particularly in those school systems using open-circuit telecasts originating from educational-television stations—has been the matter of scheduling. This has taken two principal forms. First, there has been the difficulty of timing the telecasts to fit the schedules of as many schools as possible. (For example, fifth-grade arithmetic is not usually taught in all

elementary schools of a given school system at the same hour each day.) The second aspect of the scheduling problem has been how to fit a thirty-minute telecast into class periods of varying length. (Observers agree that thirty minutes is not necessarily the optimum length of the telecast part of the lesson in every subject every day, but educational-television stations, like their commercial counterparts, traditionally operate in terms of thirty-minute blocks of time.)

A technological problem that currently limits the use of television as a medium of instruction has to do with transmission of the signal. Open-circuit broadcasting, in which the signal is sent out from a transmitter, has the advantage of being able to cover a wide area, and thus it can reach many school systems. It has the disadvantage of being limited to one program or lesson at a time. This means, for example, that in the course of a six-hour school day only twelve thirty-minute lessons can be broadcast—the equivalent of only one for each grade level. Closed-circuit broadcasting, in which the signal is carried by coaxial cable, has the advantage of being able to transmit several lessons simultaneously (six in the case of Hagerstown), but it has the disadvantage of not being able to cover a wide geographic area except by the use of microwave relays or long-line telephone wires, both of which are relatively expensive. The electronics industry is currently working on several different solutions to this problem.

Other problems persist. For example, the respective roles of the studio teacher and the classroom teacher as members of a teaching team have not yet been fully defined, although in some instances such teams are functioning with remarkable skill. Similarly, the techniques of teaching and learning in large-class situations have by no means been fully mastered. The problem of dealing effectively with individual differences among students, particularly at the elementary and secondary level, also needs further exploration.

At the college level, the biggest single problem has been how to interest the very best teachers in using the new medium.

To sum up, television has already demonstrated that it can

be a powerful tool for helping to raise the quality of education in the face of rising numbers of students and a shortage of able teachers. It also has demonstrated its potential for attacking other important educational problems, such as challenging able students to their full potential and bridging the gap between school and college; bringing top-quality teaching to students in small rural high schools; upgrading the quality of teachers already on the job; and finally, making more effective use of the physical and financial resources available to schools and colleges.

Much has been learned in the past five or six years about television's potential as an important educational resource; much more remains to be learned. On the basis of the experimentation to date, it appears that when schools and colleges have learned to capitalize on the full potential of the medium, students at all levels will receive a far broader, deeper, and richer education than has been possible heretofore.

The College Experience

Well before most of the experiments described in this report began, a few pioneering colleges and universities were offering courses over television for the benefit of the general public. But there was no assurance that television could be used effectively for direct and systematic instruction of students either on campus or off campus. How well could teachers really teach before the television cameras? How well could students learn in front of the receiving sets? Would students and faculty members accept the new medium? And what would televised instruction cost, in comparison with the cost of conventional instruction?

In 1954, the Fund for the Advancement of Education made a grant to the Pennsylvania State University for a systematic inquiry into these and related questions. This was the beginning of the most extensive program in the use and evaluation of televised instruction in American higher education. By the spring of 1958, four years after the original grant, some 3,700 of Penn State's 14,000 students were registered for one or more of thirteen courses taught over closed-circuit television on the campus at University Park. (See page 26 for a summary of the major findings in the Penn State experiment thus far.)

For experimental purposes, televised teaching in the initial stage at Penn State was deliberately kept as similar as possible to the teaching in an ordinary classroom. The television cameras were set up in regular classrooms, and the teachers had classes of students in front of them as they taught—a group of forty or fifty in one case, and about 150 in another. Student

technicians manned the cameras and staff members operated the controls. A coaxial cable carried the sound and picture signals to television receiving sets in nearby classrooms, where other groups of students met. It soon became clear, however, that this was not the best way to take full advantage of the potentialities of television; during the next semester the courses originated from a smaller classroom, with few or no students present. Most instructors still believed they needed some students present to help pace their presentations. But this practice also had its disadvantages, and gradually it was abandoned too. Most instructors at Penn State now teach directly into the cameras, so that there is direct eye-to-eye contact between the teacher on the television screen and the student. This also has become the general practice elsewhere.

In colleges and universities, attempts have been made to try on television a wide variety of courses in the undergraduate curriculum. Most of the courses selected have been those that enroll relatively large numbers of students and that traditionally are taught in large part by the lecture method, or by lectures illustrated with demonstrations.

The table on the following page illustrates the wide variety of college courses being taught over television in some of the experiments supported by the Fund and the Foundation.

Some of these courses are now taught entirely by television —for example, courses in general psychology, introductory sociology, music appreciation, elementary meteorology, and air science at Penn State. The only personnel needed other than the instructor have been supervisors or proctors in the classrooms, and sometimes it has been possible to dispense with them.

This arrangement has been criticized on the grounds that students cannot ask questions for clarification. Some institutions have therefore assigned at least a responsible graduate assistant to each receiving room. Of course, not all teachers have been sorry to see questions eliminated; some believe that if one outcome of televised instruction is to force students sometimes to find answers to questions on their own, the students will thereby become more resourceful in directing their own learn-

EXAMPLES OF COLLEGE COURSES TAUGHT BY TELEVISION

Case Institute of Technology

Electric and Magnetic Field Theory, General Chemistry, Graphics

Chicago City Junior College

American Literature, Biology, Business English, Humanities, Physical Sciences, Psychology

University of Detroit

English, History, Psychology, Spanish, Theology

University of New Mexico

Anthropology, Biology, English, Mathematics

Miami University

Air Science, Education, Physiology, Zoology

Oregon State Board of Higher Education

Education, General Chemistry, United States History

Pennsylvania State University

Accounting, Air Science, Algebra, Economics, Education, German, Meteorology, Military History, Music Appreciation, Psychology, Psychology of Marriage, Sociology, Zoology

San Francisco State College

Creative Arts, Economics, English, Psychology

ing. But the criticism has led to experiments with two-way communication systems at Case Institute of Technology, the State University of Iowa, Penn State, and the State College of Washington. The latter three have used simple "talk-back" sound systems, but Case has developed two-way television, so that the instructor can both see and hear his students.

There has been general doubt that individual students can be quizzed with real efficiency when a section numbers 200 students or so. It is also doubtful that the present two-way systems are adequate to sustain a provocative discussion among students in various classrooms. Because of such limitations, the most common use of television at the college level has been to combine it with traditional techniques—to mix televised lecture-demonstrations with face-to-face sessions in smaller groups for discussion, problem solving, recitation, or laboratory work. Most often, the different sessions have not been held on the same days of the week.

To avoid the loss that results from separating the lecture and follow-up discussion by a day or so, there have been several experiments with a divided period—thirty or thirty-five minutes of televised instruction and a discussion session of fifteen to twenty minutes.

Miami University in Oxford, Ohio, has developed still another alternative in a psychology course that meets twice a week for ninety minutes each time. The instructor lectures over television for the first hour or so. Then graduate assistants or seniors majoring in psychology lead discussions among the students in the receiving rooms for the remaining thirty minutes.

Endless variations are possible in determining how best to use class time. An experiment with a literature course at New York University showed that three times as much material could be covered in a televised lecture as in a conventional one, because of the better preparation of the instructors and the absence of interruptions by the students. This calling into question of the traditional ways of organizing college courses may well be a valuable by-product of the effort to adapt courses to the television medium.

Comparative Effectiveness

The primary concern of all the experiments, school as well as college, is with the effect of televised teaching, in its many forms, on student learning. This is a question not easily answered, for only crude instruments are available for measuring the complex process of learning. Ideally, the objectives of a course should be established firmly in advance, and then tests can be prepared to measure how well these objectives are achieved. But the objectives of most college—and school—courses are not and can not be stated in such behavioristic terms. They exist vaguely in the minds of the teachers, and considerable effort is required to arrive at statements specific enough to guide educational psychologists in preparing scientifically acceptable tests—even tests designed to measure only factual learning.

In addition to the mastery of subject matter, educators usually have many other objectives in mind—for example, to teach students to think more critically and make sounder judgments, to deepen their interests in many areas of human experience, and to acquire attitudes favorable to their major fields of study. Attempts to measure the contributions of teaching in these terms have not been very successful.

Nevertheless, the effort to measure more than the acquisition of information has been pursued in the various college television experiments, notably in general psychology courses at Penn State. The first trial took place in the spring of 1955. Two instructors were involved. During the morning, one taught over television a class of forty in the originating room and two other classes of forty in "remote" classrooms, while the second instructor taught a class of forty in a conventional classroom in another building. Later in the day, the instructors reversed their situations. The students were assigned to the different classes at random. The instructors did not change their usual teaching methods but as far as possible presented the same lectures over television that they presented to their conventional classes. On the final examination, there was no difference in

achievement between students in the television classes and those in the regular classes. When they were asked to rate the course relative to other courses for its contribution to their educational advancement, the students taught over television rated the course lower than the other students rated their conventional classes. But no differences were found in the students' general attitudes toward psychology as a field of study, in the extent to which the course affected their "authoritarian" attitudes, or in continuing their study of psychology in another course. Considering that the instructors in the experiment were somewhat negative in their attitudes toward teaching over television in the first place, that little was done to adapt the course to television instruction, and that nothing was done to compensate for the lack of discussion in the television class, the Penn State experimenters found the results of this early experience highly encouraging.

During the fall of 1956-57, a second experiment took place with the general psychology course at Penn State. In part, it was a comparison between use of closed-circuit television, reaching a large class spread through many small rooms, and use of a large lecture hall where 200 or more students could be taught in a body.

Two instructors again taught the course in both situations, teaching the large class immediately after the television class and taking care to cover the same material each time. They adapted their methods, however, to make use of techniques best suited to the two situations. Because it seemed possible that in the previous experiment textbook reading might have accounted for no difference in examination scores, the course was taught in the second experiment without a textbook, so that greater emphasis was placed on learning while in class. Finally, two competent test constructors spent almost full time working with the instructors to build tests that hopefully would measure not only factual learning but learning of principles, understanding of complex concepts, and ability to solve problems. Again students were randomly assigned to the various classes. They were not aware of being subjects in an experiment. Four

different tests were administered during the term, including the final examination; the analysis illustrated the importance of not depending on any single test. In one test, the results favored the television classes; in another, the large class. But no difference in achievement was apparent on the other tests, and the average total score for the semester also revealed no difference in achievement between the classes taught by the two methods.

Generally, the same result has come from the other college experiments that have compared televised teaching with classroom teaching in groups of varying size. The television students have done as well in general chemistry, elementary business law, introductory sociology, elementary meteorology, and music appreciation at Penn State; in general psychology, air science, and physiology at Miami University; in English composition, French reading, and history at New York University; in American government and modern literature at the State University of Iowa; in introductory sociology at the State College of Washington; and in psychology, basic communications, creative arts, and economics at San Francisco State College. In some instances, the generalization would not hold, perhaps because of the nature of the subject, or the skill of the instructor, or the length of time the students were exposed to televised teaching. Tests at Miami University, for example, suggest that the course in introductory economics might not be suitable for television, possibly because of the abstract nature of what must be learned. Nevertheless, most researchers believe that much more experimentation is needed before they can validly determine which courses can best be adapted to television. It is clear, however, that in many college courses students can be expected to do equally well in examinations whether they have been taught by a teacher in a regular classroom or by the same teacher over television.

Faculty and Student Opinion

The most valid test of faculty opinion may come from the teachers who either volunteer or accept an invitation to teach

over television. At Penn State, where wide use of television has been encouraged, this number has increased year by year. Curiosity or a desire to experiment may account for part of the increase. But in some cases it is clear that a majority of the departmental faculty approved the use of television in the belief that it would mean better teaching, especially in courses with large enrollments.

The course in elementary accounting in the School of Business at Penn State illustrates this line of reasoning. This course is required every year of several hundred students. The classes are handled by all ranks of teachers from graduate assistants up to associate professors. Some of the graduate assistants are popular with the students, and some teach well, but there has been feeling among the regular members of the department that the teaching was not always as good as it should be.

Last year, a teacher with long experience and an unusual ability to stimulate an interest in his subject taught several elementary-accounting sections over television. He gave two weekly lecture-demonstrations, while graduate assistants directed a weekly "laboratory" period. By mid-year, students were asking to switch from small conventional classes to a television class with this superior instructor. In all, the arrangement was thought so successful that it was decided to teach almost all elementary-accounting sections in this way this year.

The polls at Penn State showing that some fifteen per cent of the faculty are willing to experiment with television in their own courses reveal a growing interest in doing so. They indicate also that many of the non-TV teachers still view the innovation with disfavor. These teachers object because they do not have contact with the students; they cannot give the students individual attention, gauge the students' response to the presentation, or have the students ask them questions. However, if student enrollments should make it necessary for these teachers either to teach over television or to teach face-to-face in classes of 150 or more, a large proportion would prefer the large classes. The most favorable vote for television among the faculty at large has been the fact that the majority favor hav-

ing their own children take a course by television from the best professor in a department rather than from a lesser but adequate professor in a regular class.

The medium itself seems to be something most teachers can become accustomed to—after some initial stage fright—and the general opinion is that they like it better than they thought they would. But teachers with brief experience in television do not prefer it to the way they have been teaching for many years. However, when they have been asked to compare the values of teaching by television with teaching in classes of 150 students or more, they have rated teaching by television superior by a large margin.

Careful polls of student opinion at Miami, Penn State, and San Francisco State have shown that students usually prefer a conventional class, and usually think they learn more in such a class. They may object to television because of no contact with the instructor, because they become bored and sleepy watching the television screen, or, in some courses, because the cameraman has too much control over what they are able to see. But others prefer television, either because there are fewer distractions, because the novelty of it makes the class more interesting, or because the professors are better, or better prepared.

Even though many college students do not ordinarily prefer televised teaching, there are circumstances in which they do—or would. At Penn State, students were given some experience with both television and classes of 150 or more, then told to choose one or the other for the rest of the semester; they chose television, six to four. At Miami, a majority of the students have said they would enroll in a television class anytime —if it meant they would be assured of being taught by an excellent instructor.

These experiments have been intended, of course, to test the effect of *televised* instruction. In the interest of careful measurement, they have compared the work of *the same teacher* when he was teaching by this medium and in the classroom. But in courses with large enrollments, this is not the practical

choice before either an institution or an individual student. The choice is between one teacher on television and several in the classroom. The experiments have made no attempts to measure whether one teacher is able to do a better job of teaching over television than others can do face-to-face, but some faculty members and many students certainly believe there are teachers who can. As more truly superior teachers come to use television, and as the number of less able people on college faculties increases, it seems reasonable to expect that televised teaching will find more support on the campuses than it has so far.

The Feasibility of Televised Instruction

It might seem offhand that the comparative cost of televised instruction at the college level could be easily determined. But this is not a simple matter. One reason is that cost figures are meaningless except as they relate to the figures for other methods of instruction. But these methods are so varied on college campuses, and may be expected to change so much in the coming years, that comparisons must be made course by course.

The most thorough accounting available so far was made at Penn State during 1956-57. The costs of conventional and televised instruction were compared in general psychology, introduction to accounting, introductory sociology, and air science. In all four courses, televised instruction was found to be less expensive than conventional teaching. This was so for many reasons. Penn State used equipment that was relatively low in cost. Students served as cameramen. Other students served as engineers. (A full-time engineer was not hired until April, 1957.) There was a plentiful supply of graduate assistants. Undergraduate students served as room proctors in many cases. Most important of all, enrollments in the courses were high, ranging from 169 in sociology to 810 in air science. With these factors operating, Penn State was able to conclude that televised teaching in these courses cost less than conventional teaching. It was found that televised instruction could "break even" with conventional methods when 200 or more students

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SUMMARY OF FINDINGS AT PENN STATE

Comparative Effectiveness

1. In 29 out of 32 controlled comparisons in seven different courses, there were no significant differences in *achievement* between students taught via closed-circuit television and those taught in the conventional manner. (The *same* teachers were used in each pair of comparisons.)
2. In three different courses, there were no significant differences between scores on course-related *attitude* tests taken by students taught via TV and those taught by the same teachers in the conventional way.
3. No significant differences in students' achievements were found when *proctors of varying status* were used to supervise classroom groups of students in televised classes. Proctors included peers, seniors, graduate students, and faculty members.
4. No significant differences in student achievement were found in comparisons of *classes of various sizes* taught via television. Size of classes ranged from 11 to 119 students.
5. Several methods of providing for teacher-student interactions were studied in different courses. These included the use of questions and answers over an intercommunication system between the TV classrooms and originating room, and the rotation of students through the TV originating room. Neither of these methods produced measurable increments in learning, but the students strongly favored the use of the intercommunication system.

Appropriateness

1. Television can be used to extend the reach of the most experienced instructors to large numbers of students, especially in introductory courses taught by the lecture-demonstration method.
2. Televised instruction can be supplemented by laboratory or discussion sections in small groups under the leadership of graduate students or selected seniors.
3. Teacher-student interactions can be achieved through the use of a two-way intercommunication system, but teachers and students must learn to use the system effectively.
4. Simple television systems can be used to magnify demonstrations in laboratories in such a way as to facilitate laboratory instruction.
5. Test questions of the conventional objective and essay types can be presented over television to large numbers of students. Television also shows promise for the presentation of lifelike problem situations for students to solve, thus opening up new dimensions of testing.

Acceptability

1. Student responses show that on the average 78% of students think that the use of television is either a "very good" or "fairly good" means of teaching courses with large enrollments.
2. Students in TV classes ranked televised instruction first over conventional instruction in classes of 200 taught by the same instructor, or classes of 45 taught by graduate assistants.
3. In five courses, students were given instruction via television, and in face-to-face situations by the same teachers. They were then given a choice between the two methods of instruction for the remainder of the semester. On the average, students chose televised instruction six to four over face-to-face instruction by the same teacher in a large class.
4. Attitudes toward televised instruction by faculty members have varied greatly. A few are quite negative toward it, some are enthusiastic, and the largest proportion appears to be undecided or indifferent. Many faculty members have not observed televised classes.
5. Almost every semester over the eight-semester period that television has been used for instruction at Penn State, there has been an increase in the number of courses and instructors participating in the television project.

Feasibility

1. Moderate-cost "professional" vidicon television equipment is entirely adequate for the presentation of televised instruction on a large scale. Low-cost "industrial" vidicon equipment is adequate for magnifying live demonstrations (including use of the microscope) in large auditoriums or laboratories.
2. Personnel usually found in a university can operate and maintain this equipment. Many functions can be handled by students.
3. Careful cost analyses in four well-established courses showed savings of $38,000 in one year through the use of television as compared with the usual ways of teaching these courses. Comparisons included all operating costs for television as well as depreciation of equipment.
4. Average costs per student-credit unit for the year in these four courses were reduced from $9.48 for conventional teaching to $5.44 for televised instruction.
5. It was found that the "break-even" point in relative costs was reached when 200 students were enrolled in a course. Below this figure, conventional teaching in groups of 45 students was cheaper; above it substantial savings are possible through the use of television.

were taught simultaneously in a given course. With 14,000 students on the campus, Penn State can expect to enroll more than a thousand students each semester in many of its freshman and sophomore multiple-section courses.

The cost of operation elsewhere may be lower or higher than at Penn State. At Miami University, where another careful accounting has been made, it was found that televised instruction can "break even" when 220 students are taught simultaneously in a given course.

The most significant factor affecting future costs, however, will be the larger numbers of students involved. Already there have been instances in the college experiments where many more students could have been enrolled in a television section than actually were enrolled. As institutions expand, many more of them should be able to make economical use of the medium, and those already as large as Penn State may find that a television system can actually save money without impairing the quality of instruction.

Further Adaptations

Still further adaptations of television are possible at the college level. Some already are being tried that can have a significant bearing on the feasibility of televised instruction at smaller colleges and universities. A few examples may suggest what is possible.

San Francisco State College, the University of Detroit, and Chicago Junior College are using local educational-television stations (open circuit) to broadcast the lecture portions of a large number of their regular courses. Students generally view these lectures in their own homes two or three days a week, then come to the campus periodically for discussion, quizzes, and the like. Where the arrangement is found workable and satisfactory, the savings both in faculty time and facilities can be substantial.

In Oregon, the State Board of Higher Education is using a combination of closed-circuit systems and a low-power station to join four colleges and universities, one of them private, in

a television network. Outstanding lecturers are being drawn from the three public institutions, and the telecasts are available simultaneously to students on all four campuses.

Stephens College in Columbia, Missouri, has successfully used closed-circuit television to offer a new course in the social sciences, employing the inter-disciplinary approach and making use of distinguished visiting lecturers as well as its own faculty. This course, required of all entering students, is taught by a combination of televised lecture-demonstrations and classroom discussion. A twenty-minute telecast is brought to students in viewing rooms, and is followed by forty minutes of discussion with one faculty member to each group of fifty students.

Smaller institutions also may make much use in the future of entire courses given by outstanding teachers and recorded on film or video tape. These can be projected with standard film projectors or distributed to one or many classrooms throughout a building by means of a simple closed-circuit television system. Films or video tape could make it possible for small colleges to offer some courses they could not otherwise find any teachers for—courses in Russian and other foreign languages, for example, and in advanced physics and other sciences. In any course, film or video tape could offer the best teaching available anywhere, with no more limitations than are found in televised lecture-demonstrations. It already seems likely that many institutions will use such courses at least as a supplement to their teaching staff—available from a library, as books are now, for students to view individually or in groups. Some institutions are already prepared to experiment with them as a means of releasing teachers from some lecture assignments so they can give more individual instruction.

Reaching Students at Home

Something of a record may have been set in the fall of 1957 when New York University introduced people in the New York metropolitan area to college credits by television with "Sunrise Semester," an early-morning program on WCBS-TV. A course in comparative literature ran the full academic year,

enrolled well over 100 students for credit each term, and attracted an additional daily audience estimated to average some 100,000 persons. "Sunrise Semester" has proved so popular that this year four courses are being offered for credit—physics, sociology, history, and literature.

A more ambitious effort is now well under way in Chicago. By broadcasting more than forty hours of college course material every week, the Chicago City Junior College hopes to make it possible for extension students to earn an Associate in Arts degree entirely by television. "TV College" was inaugurated over the Chicago educational station, WTTW, in the fall of 1956. Teachers drawn from the several branches of the Junior College taught four subjects over television that fall, five the following spring, and nine during each semester of the 1957-58 school year. A still heavier schedule is under way during the current year. Required courses televised so far are: social science, physical science, the humanities, biology, and English composition, plus courses in college algebra and geometry, national government, municipal government, general psychology, principles of accounting, shorthand, and the slide rule.

Television students must meet the Junior College's usual entrance requirements, enroll in one of its six branches, pay a small fee for registration and a study guide, and buy their own textbooks. The students may follow the telecasts during the daytime hours or wait for them to be repeated one week later during the evening. They must work out exercises in a study guide and mail all written assignments to a "section teacher," who corrects, grades, and mails them back. Depending on the course, the students may report to the Junior College branch where they are enrolled for a conference with their section teacher one to three times a term. Both the television teacher and the section teacher are available at scheduled hours to answer telephoned questions. All examinations are given at the Junior College branch.

By the fall of 1957, "TV College" had 1,511 students enrolled

for a total of 8,476 credit hours. Another 5,728 persons were registered as noncredit students in one or more courses.

How well do the students who remain through a course learn? During 1956-57, the Junior College's department of examinations compared the scores of extension students in several courses with those of two groups of regular students—students who were taught the same courses in the conventional fashion, and students who viewed the telecasts in the classroom and then received twenty minutes of further instruction from a teacher in the classroom. At first, the comparison provided a surprise: the extension students showed superior achievement in all four subjects: English, social science, biology, and political science. Further analysis revealed that the extension students were superior to the regular students in mental ability and in proficiency in these four subjects before the courses began. When the final scores were adjusted to compensate for the initial inequality, it was found that there was no difference among students taught by any one of the three methods.

Who were the extension students? They were women, for the most part, in their twenties, thirties, and forties. One-fourth of them already had completed a year or more of college. Over two-thirds expected to receive the Associate in Arts degree, and one-third expected to take all the necessary courses by television. More than half expected to continue beyond the two-year degree. This was a wholly new sort of student body for Chicago City Junior College—older, more able, and more highly motivated than its ordinary students. The section teachers who met these extension students at conferences found they did more of the collateral readings than regular students did, wrote their assignments with greater care, and showed greater interest during discussion sessions. Their stronger motivation, it seemed, helped make up for whatever was lost in the way of discussion and closer relationships with the teachers.

Already the Chicago City Junior College has graduated several students who completed all of their course work by means of television. One of these was a woman of thirty-four, the mother of ten children.

College Level Courses for Able High School Students

Three experiments supported by the Fund or Foundation aim to provide courses for college credit to superior high-school students. One of these was carried on in 1957-58 at San Francisco State College; others are being carried on this year by Miami University (Oxford, Ohio) and by the University of New Mexico. The San Francisco and New Mexico experiments depend on local high-school teachers to lead discussion in the classes after the telecasts. Miami University is combining the use of television with teaching by its faculty members who travel to extension classes in surrounding high schools. Either arrangement means that outstanding high-school seniors, and even some juniors, can be given courses that constitute a greater intellectual challenge to them than the courses their high schools can offer. And when they are ready to enter college, they will be able to do so with advanced standing.

In-Service Courses for Teachers

There also is growing interest in the use of television to give in-service training to teachers. For two years, the Texas Education Agency (state department of education) has offered an introductory course in education, broadcast by eighteen commercial-television stations, to college graduates interested in preparing for teaching careers and to liberal-arts-college graduates who have been teaching on emergency certificates in order to start them on the way to permanent certification. This year, in addition to the course offered for prospective teachers, a special series of broadcasts entitled "Texas Curriculum Studies" is being offered to participants in a state-wide curriculum study.

The most dramatic experiment in the use of television to upgrade teachers already on the job began in the fall of 1958, when the nationwide course in modern physics, "Continental Classroom," was launched. The course, which is being given each school day for the full academic year 1958-59, is an unprecedented effort to bring about a swift and substantial improvement in the teaching of physics in the nation's high

schools. Nearly 250 colleges and universities throughout the country are offering credit for the course. Jointly sponsoring the venture with N.B.C. are the American Association of Colleges for Teacher Education, the Ford Foundation, and the Fund for the Advancement of Education. In addition, substantial financial support has been provided by several major corporations, including the American Telephone and Telegraph Company, General Foods Corporation, International Business Machines Corporation, the Minnesota Mining and Manufacturing Company, the Pittsburgh Plate Glass Company, Standard Oil Company of California, and the United States Steel Corporation.

The principal teacher of the course is Dr. Harvey E. White, professor of physics at the University of California (Berkeley). Other internationally known scientists, including several Nobel Prize winners, participate from time to time.

Experience in the Schools

Even before the first results came out of the experiment at Penn State, a bold proposal was made to the Fund by the St. Louis Educational Television Commission and the St. Louis Public Schools: to offer several courses over television, without any supplementary teaching, and to have pupils receive this instruction in classes of up to 150. It was one thing to televise an entire course in college, quite another to do so in the public schools, where there was a broader range of intellectual ability among the students and, it might be assumed, a generally lower level of motivation. But if it could be done satisfactorily, the services of outstanding teachers could be spread widely.

During the 1955 fall semester, lessons in ninth-grade general science and English composition were telecast for thirty minutes a day, five days a week, through the facilities of the St. Louis community-owned station, KETC-TV. One hundred and twenty-two ninth-graders viewed the telecasts as a group in one high school; 146 did so in a second. Since neither school had classrooms that would hold such large numbers at a time, the groups met in large music rooms. One experienced teacher was in each room to receive assignments and meet any unforeseen occurrences—but not to teach in the usual sense of the word. She was assisted by a college graduate who was not a professional teacher.

Lessons in second-grade spelling were telecast for two semesters in the spring and fall of 1956. These were presented twenty minutes a day, five days a week, and the children watched them in classes of seventy and ninety-eight, seated at lunchroom tables in two elementary schools. Again an experi-

enced teacher was in charge of each room but did not teach. Here she was aided by a retired elementary-school teacher.

How did the television students fare? In general science, they did as well as a comparable group of students taught in the conventional manner. In English composition, there was a suggestion that they made slightly greater gains. In second-grade spelling, a difference favored the control students; the two groups did equally well in a test of second-grade words, but when they were tested on words considered above the usual second-grade level, the conventionally taught students did better than those in the experiment. The report of these findings included a suggestion that the difference in the spelling test results might be explained by the fact that large-group television teaching must of necessity be geared to one level of instruction.

The results of the St. Louis experiment also suggested that televised instruction could not do the whole educational job, and the major interest thereafter turned toward a combination of televised instruction and some "follow-up" instruction by the teacher present in the classroom.

The Pittsburgh Program

At the same time the St. Louis experiment began, another venture was launched in Pittsburgh. Its purpose was to raise the quality of teaching in the local schools simply by selecting outstanding teachers, freeing them from all other duties so they could prepare their lessons with great care, and presenting their teaching every day over the open-circuit facilities of community-owned WQED-TV. Grade-school children, and later high-school students, viewed these telecasts in classes of conventional size, averaging about thirty-five pupils to a room. Their regular teachers were in attendance and supplemented the telecasts with their own "follow-up" instruction—directing drill, practice, and review, answering questions, maintaining the back-and-forth of class discussion, helping individual students, and otherwise carrying the teaching process beyond the televised presentations.

With this emphasis on studio teachers of high quality, it was a logical extension of the Pittsburgh approach to reach beyond local resources in the selection of teachers, and in 1956 Harvey E. White was invited to develop a new high-school physics course and present it over WQED. Encyclopaedia Britannica Films, Inc., filmed the entire course of 162 half-hour lessons in color and in black and white as they were presented, and now offers the film for sale to any school or school system for use as a film or a television presentation. (It is estimated that well over 100,000 students in 500 school systems throughout the country received instruction in physics by way of the White film in 1958-59.)

The Pittsburgh television experiment tried from the outset to improve the quality of teaching not only by putting superior teachers on television but by offering courses that otherwise could not be offered under conventional arrangements. A beginning course in conversational French was offered to fifth-graders in 1955-56. At first, the plan was to teach the course entirely by television, but teachers in the classrooms found the children needed drill and practice sessions as well. However, they also found that they themselves learned enough along with their students to lead these sessions. The course became one of the most popular in the program and, along with an intermediate course, is still offered today.

The most complete report so far available on test results in Pittsburgh is for 1956-57. That year, televised instruction was offered in fifth-grade arithmetic, reading, social studies, and French, and in high-school physics. Tests were administered (in all subjects but French) to several television classes and several conventional classes. As in St. Louis, no very exact comparison of the two groups was possible, and there were many variations on how individual classes in each group were taught. It was thus impossible to conclude from the results that either method was superior to the other—either regular classroom teaching or televised teaching supplemented by classroom work. However, the finding of wide variations of achievement among rather comparable classes of students within the two

groups apparently suggests that the effectiveness of the televised lessons depended to an important degree on the quality of the "follow-up" by the teachers in the classrooms.

The program not only continues today but has been accepted to a notable degree by the parochial as well as the public schools of the Pittsburgh metropolitan area. In 1958-59, seven courses —including Russian—are being televised. In western Pennsylvania, more than 30,000 students in 351 public schools, as well as several thousand additional students in parochial schools, are taking one or more of these courses.

The Alabama Program

Quite similar to the Pittsburgh program in its operation so far has been Alabama's state-wide program in televised instruction for the schools. Its aim is to raise the standard of teaching in elementary and secondary schools throughout the state. It has at its disposal not one television station but a network of three, the only state-wide network of open-circuit educational-television stations in the nation, as of this writing. (Several others are being planned.)

During the 1958-59 school year, courses in Alabama history, biology, chemistry, geometry, physics, and Spanish were broadcast on a half-hour schedule, most of them four days a week. Study guides went out to the participating schools well in advance, offering classroom teachers suggestions for activities to follow the telecasts, including questions to discuss and laboratory work for the students to do.

There is growing evidence that this service is enabling schools not only to offer better teaching but to offer courses they could not have offered otherwise. There is also evidence that the service is being used by a substantial number of teachers who could not possibly provide adequate instruction without some such assistance as the program provides.

The number of schools making use of the Alabama program has been expanding steadily. When the program began in the fall of 1957, only 100 of the 1,000 schools in the network's reception area reported having even a single television set. By

the spring of 1958, more than 100 schools were making regular and continuous use of the network's services, and in the 1958-59 school year more than 16,000 students in 222 schools throughout the state received daily instruction over the Alabama ETV network.

The Chelsea Project

In the heart of New York City, closed-circuit television is being used to attack a uniquely different kind of educational problem—the problem of helping newcomers to these shores make a more effective adjustment to the American culture. This experiment, known as the Chelsea Project, has two main objectives: (a) the attainment of a closer relationship between school and community, and (b) raising the educational and cultural sights of an entire neighborhood. Locus of the experiment is a low-income housing development whose residents comprise three primary ethnic groups in roughly equal numbers—whites, Negroes, and Spanish-speaking people of Latin American and Puerto Rican origin.

Within the development are located a public school, a settlement house, and a municipal health center. All three are linked by coaxial cable with the apartment buildings of the housing project. From the school emanate televised courses in English, Spanish, elementary science, music, speech improvement, health instruction, and other subjects. These televised courses, broadcast during school hours, are available to students in the classroom and to parents in the home. During the evening hours, special programs of interest to residents of the neighborhood are broadcast from the health center and the settlement house.

Begun in the fall of 1957, the project is now in its second year. Its sponsors—the New York City Board of Education, Hudson Guild Neighborhood House, and Language Research Inc., of Harvard University—hope that ultimately it will bring the school, the home, and the community closer together and help to re-establish channels of communication that are too

often lost or forgotten in the heterogeneous urban culture of large cities.

Washington County, Maryland

The largest single experiment in the use of classroom television in a school district was launched in the fall of 1956 in Hagerstown, Maryland, county seat of Washington County. This experiment undertook to answer the question of whether the new medium could be used as a resource to provide the 18,000 students in the county schools a richer education, and at less cost, than was possible by conventional methods of instruction.

The Washington County experiment was significant in what it set out to do, and it gained in importance from the wide attention it attracted from the very beginning. Thousands of educators and lay people have visited Hagerstown to observe the experiment in action. To many of these—school-board members, superintendents, principals, teachers, and college and university teachers of students preparing for teaching careers—Hagerstown has provided an important test of whether teaching by television can be superior to the teaching common to most classrooms.

Several features set the experiment apart from those that had gone before. Some classes were much larger than usual—up to four times the county average of thirty-two pupils. Efforts were made to find the best means of making use of the telecasts in the classrooms and to develop the classroom teachers and the studio teachers into effective teaching teams. Beyond this, Washington County set out to explore the full potential of television in the service of a school system. The experiment therefore involved more of everything—more televised lessons, a broader range of subjects, and more schools, teachers, and pupils than any previous experiment. (See the table on the following page for a list of subjects being taught by television this year.) To make this possible, it was decided to use not the open-circuit method, as in Pittsburgh and St. Louis, but a closed-circuit system. This too was by way of experiment-

SUBJECTS TAUGHT BY TELEVISION IN WASHINGTON COUNTY, MARYLAND

(School Year, 1958-59)

Grade	Subjects
First:	Art, Enrichment, Music, Numbers, Reading
Second:	Art, Enrichment, Music, Numbers, Reading
Third:	Art, Enrichment, Music, Numbers, Reading
Fourth:	Arithmetic, Art, Music, Social Studies
Fifth:	Arithmetic, Art, Music, Social Studies
Sixth:	Arithmetic, Art, Music, Science
Seventh:	English, Geography, Guidance, Mathematics, Practical Arts, Science
Eighth:	English, Guidance, History, Mathematics, Practical Arts, Science
Ninth:	Guidance, Science
Tenth:	Guidance, Plane Geometry
Eleventh:	Guidance, Physics, U. S. History
Twelfth:	English (two courses), Guidance

ing, for although the closed-circuit system had been used within a single building, or to connect adjoining buildings in colleges and universities, here it was to connect the forty-eight schools of a county system, spread over 462 square miles.

A closed-circuit system has certain advantages for a school system. At present, for example, an open-circuit station is limited to a single channel, which means it can transmit no more than one program or lesson at a time; over the coaxial cable of a closed-circuit system several different lessons can be transmitted at the same time. In Hagerstown, six channels can be used simultaneously. The Hagerstown experiment was intended to discover, among other things, whether the cost of closed-circuit television over moderately long distances was economically feasible so that any school system could have its own television operation and could encompass in its televised instruction program a wide selection of the courses in its curriculum from the first through the twelfth grades.

In the fall of 1956, instruction in ten subjects went out from the "television center" (a corrugated metal shed that was once the school system's agricultural shop) to 4,941 students in eight schools in Hagerstown. By the fall of 1957—one year later—instruction in twenty-one subjects was being televised, and the network of coaxial cable reached out to some 9,781 students in twenty-two schools. The entire Washington County school system of forty-eight schools, with a total enrollment of 18,000 students, is expected to be included in the network by the end of the 1958-59 school year.

Long before all this had begun, however, the Hagerstown school authorities set out to overcome the fear voiced by some critics that television would reduce the classroom teacher to the status of a monitor. Fortunately, the teachers in this school system had long played an active role in planning the curriculum. A restudy of the curriculum had been undertaken eight years earlier, involving every teacher in the county. Questionnaires polled them on what they thought was good and bad in the instructional program. Then there were statements of policy, notebooks in which the teachers could record their ideas,

summer workshops for six years, and other workshops between semesters. By the time the television experiment began, there was a general understanding among the teachers as to what was to be accomplished in each subject in each grade.

During the summer of 1956, a workshop of teachers and supervisors planned the main lines of the first year's televised courses. The learning process was analyzed in some detail, in an effort to make clear from the beginning just which functions could be performed better by the studio teacher and which ones by the teachers in the classrooms. Generally speaking, the workshop concluded that the studio teacher would be in the better position to stimulate interest, to inform by word and demonstration, to show applications of general concepts, to raise questions, and to challenge pupils to assume more responsibility for their own learning. The classroom teacher, on the other hand, was thought better able to handle classroom discussion, to care for the individual differences in pupils, clear up immediate misunderstandings, supervise drill and problem-solving sessions, provide remedial teaching, help the pupil establish relationships between things learned and his daily activities, provide opportunities for pupils to exercise critical judgments, interpret the testing program, and give attention to the establishment of desirable habits and traits.

For each subject to be included in the television program, general outlines were developed by the classroom teachers and the teacher selected to serve in the studio. After telecasting began, daily "feed-back" sheets, regular meetings through the school year, and later summer workshops have kept the classroom teachers in close contact with the studio teachers and have brought the lesson plans under regular review. By these means, the Hagerstown school authorities believe they have not only removed fear of displacement from the minds of their classroom teachers but have gone some distance in developing the concept of team teaching. (See page 12.)

Has the teaching been improved? Hagerstown school officials believe that it has, in several ways, and preliminary test results bear out this belief. The art and music lessons by teachers who

have specialized in these fields are new to Hagerstown; classroom teachers readily acknowledge that the lessons are superior to what they could do themselves, and want the program continued. There is also general agreement that the elementary-science program has been improved substantially.

School authorities were concerned about the general level of achievement in arithmetic in the system, so they experimented with fifth-grade arithmetic in 1956-57. The testing was limited to finding out the achievement of pupils receiving instruction by television. The results indicated that the children in the televised classes had made striking progress and were above standard national norms. In 1957-58, arithmetic lessons also were televised to the third, fourth, sixth, seventh, and eighth grades. Objective tests in arithmetic concepts were given in grades three through eight. Matched-pair samples were developed on the basis of ability and initial status in arithmetic concepts at the beginning of the year. The mean growth of television students beyond comparable non-television students was statistically significant in five of the six grades studied.

Classroom teachers have stated that they find the televised lessons stimulating, because the studio teacher, free of all other duties, has been able to prepare the lessons more carefully and has been able to devise many visual materials to illustrate abstract ideas. This attitude has become especially true among teachers who are new, or new in the grade they are teaching. After a while, some of them come to believe they could do as well themselves, and to some extent their superiors seem to agree with them. Supervisors and principals have said that they have seen many teachers adopt better practices learned from their colleagues teaching over television.

It is in the secondary schools that Hagerstown has introduced its first large classes, and the largest have been tried in the junior high schools. Televised lessons have been viewed by classes of 120 to 140 students in auditoriums, cafeterias, and large classrooms. In these classes, in which mathematics, science, and "core" studies (a combination of social studies and English) are taught, about half the instruction time in each

subject is taken up by the telecast. One teacher is with the large class during this time. During the day, this teacher meets with the pupils for a second full period, in groups of twenty-five to thirty, for practice and drill, quizzes, class projects, and individual guidance and direction.

The classes in the senior high schools, while not so large as those in the junior high schools, represent a greater innovation, for the entire instruction in a subject is given in the large group. So far, classes of up to ninety-one students have been organized in such subjects as tenth-grade plane geometry and eleventh-grade United States history. The classes are homogeneous in the sense that the range in ability among the students in any one class is not great—a fact that has made easier the problem of dealing with individual differences. The telecasts are aimed at the average student; each classroom teacher supplements them in a way suited for her particular class.

To manage the larger classes, teachers have organized them into groups of fifteen to twenty students, each clustered before a television set in a large study hall, and each with a "chairman-recorder" and an "engineer" elected by the group. The "chairman" records attendance, distributes and collects materials, and performs other assignments made by the teacher. The "engineer" adjusts the television set before, during, and at the end of the telecast.

Many teachers and administrators in Hagerstown believe this combination of the better organized, well-presented instruction of the studio teacher and the skillful guidance of the better classroom teachers is an improvement over conventional methods. However, they recognize that no final judgments are possible until the five-year experiment has been completed.

Appraisal of the Washington County experiment also will take into account the question of whether the special costs of closed-circuit televised instruction can be met without special increases in the school budget. These costs will not be inconsiderable, even though Hagerstown has received assistance that other school systems cannot expect. Manufacturers of television equipment, through the Radio, Electronics, and Tele-

vision Manufacturers Association (now the Electronics Industries Association), have so far contributed most of the equipment in use; this is estimated to have a wholesale value of $250,000. The Chesapeake and Potomac Telephone Company has installed over seventy-four miles of cable and related equipment valued at about $500,000. The Fund for the Advancement of Education and the Ford Foundation have provided about $774,000 so far to meet special costs of staffing and evaluating the experiment.

After the end of the experiment, money must be found each year for salaries and administrative expenses of the special television staff—twenty-five studio teachers, three administrators and five clerks, six engineers and others in operations, and fourteen full-time and eighteen more part-time persons in production—a total staff of seventy-one persons. There is also an unknown in the equation: the cost of signal transmission. The closed-circuit system makes use of coaxial cable laid free of charge by the Chesapeake and Potomac Telephone Company. Use of the cable was provided free during the first two years; negotiations are now under way to establish a yearly rental fee.

Hagerstown school officials believe that if the total cost of operations and transmission can be held below $350,000 per year it may be possible to meet the costs of their new method of instruction through savings in the teaching staff, in instructional equipment, and in the more efficient use of classroom space.

So far, the clearest saving in staff time has been in the junior high schools, where seven fewer teachers than would otherwise be needed have been used with the 1,500 boys and girls enrolled in the large classes. This saving in staff time has been used to reduce the student-teacher ratio in other classes. A different kind of saving has been effected in the elementary-school program, where art and music were added to the curriculum through the use of only three teachers and the half time of a fourth. To have done this without television would have required thirty-four teachers. In terms of teacher salaries, $171,600 in instructional benefits was obtained for $17,680.

The National Program in the Use of Television in the Public Schools

The main thesis of *Schools for Tomorrow,* a report by Alexander J. Stoddard that the Fund published early in 1957, was that television could be used as a powerful resource for the teaching of very large classes. The report contended that such an arrangement could bring about substantial savings in classroom space and in teaching positions while at the same time improving the quality of education.

Following the publication of this report, Fund representatives raised with a number of superintendents, particularly in large cities, the question of whether they would be interested in testing these hypotheses. Out of these conversations grew the National Program in the Use of Television in the Public Schools, a nationwide experiment involving in 1957-58 nearly 40,000 students in more than 200 elementary and secondary schools.

Participating in the first year of the National Program were the public-school systems of Atlanta; Cincinnati; Dade County (Miami), Florida; Detroit; Jefferson County, Kentucky; Milwaukee; Norfolk; Oklahoma City; Philadelphia; and Wichita, as well as scores of other school systems in Nebraska, North Carolina, and Oklahoma.

In many ways, these school systems were representative of the nation's public schools. First, they were scattered over a wide geographic area, representing every major section of the country except the Far West. Second, the schools they embraced ranged all the way from a two-teacher high school in Nebraska enrolling only twenty-nine students to big city schools in Detroit and Philadelphia enrolling several thousand students. Third, these schools enrolled students from a wide variety of socio-economic and racial backgrounds, possessing a broad range of abilities and interests, and the schools were staffed by teachers with a similarly wide variety of backgrounds and levels of competency. Finally, the school buildings themselves differed widely in terms of age, location, and ade-

quacy of facilities. Some were new suburban schools equipped with all the modern appurtenances of education, and others were aging, dilapidated urban schools with the most rudimentary facilities.

Objectives: The major objective of the National Program is, as has been suggested, to determine whether it is feasible, using televised instruction as a major resource, to teach large classes of students with fewer teachers and fewer classrooms than might otherwise be required, and at the same time to upgrade the quality of education. It is hoped that the experiment also will provide evidence on these related matters:

1. The kind and amount of services other than televised instruction needed to establish optimum conditions for learning.
2. The scheduling and school-building problems involved in teaching large classes by television, and whether or not these problems can be met at low cost and without sacrificing quality in instruction.
3. The budgetary implications—both capital and operating —of the savings in teacher time, in building space, in equipment, and in other items of educational cost.
4. How best to develop teacher talent, not only for television but also for teaching larger classes in regular classrooms.

The National Program also has other aspects and objectives. For example, a major problem in American public education is the existence of large numbers of small rural high schools that, because of their size, are not adequately staffed to provide the kind of education their students need and are entitled to as members of a democracy dedicated to the ideal of equal educational opportunities for all its boys and girls. An accident of geography deprives thousands of students in these small schools of the opportunity to take courses that are readily available to their city cousins. In many of these small schools—and there are several thousand of them across the land—such courses as algebra, geometry, physics, chemistry, and foreign languages are either not taught at all or are taught poorly by

overworked and underpaid teachers who are not adequately prepared in the subject.

For many years, educators have been pressing for consolidation of these schools into units of sufficient size to be able to teach a full high-school curriculum adequately. This movement has had substantial success, and the number of small rural high schools has been steadily reduced, but the facts of geography indicate that there is a limit to the feasibility of consolidation. Even in a modern school bus, there are distances beyond which it is not reasonable to expect a student to travel every school day, in all kinds of weather and over all kinds of roads.

Might not there be other ways of enriching the educational program of these rural students?

Two of the experiments in the National Program are seeking answers to this question. In Nebraska, where the *median*-size high school has only five teachers and sixty-five students, teachers from the University of Nebraska are reaching out with a combination of televised instruction and correspondence materials to bring courses in algebra, geometry, physics, English, and Spanish to students in some twenty-five small rural high schools within a forty-mile radius of KUON-TV, the educational-television station in Lincoln. Last year, for example, six students in the high school at Beaver Crossing were taking physics from one of the best physics teachers in the country—Dr. Harvey White. Eight more were taking the same course at the high school in Wahoo Luther, while eleven students were taking Spanish and art over television at the high school in Weeping Water.

The same effort to bring high-quality instruction to rural students is being made in the state of Oklahoma, except that correspondence-course materials are not being used to supplement the televised instruction. Courses taught in the Oklahoma experiment during the first year were second-year algebra, chemistry, geology, physics, and solid geometry. The televised instruction in these courses originated from Oklahoma City and was also received by students in five Oklahoma City high schools. This meant, for example, that students in the rural

high schools of Mustang and Crooked Oak received the same televised instruction as the students in Capitol Hill High School in Oklahoma City.

No effort will be made here to describe in detail each of the thirteen experiments that made up the National Program during the first year.[1] As might be expected in a program involving nearly a hundred different school systems and more than a score of different courses ranging from third-grade conversational Spanish to twelfth-grade physics, practices varied widely. However, what follows is an attempt to present an over-all picture of how the National Program operated in its first year, taking account of exceptions to the general pattern.

Advance Planning: In the summer of 1957, before the experiments got under way, workshops were held to plan in detail the courses to be televised. Participating in these workshops were the studio teachers and the classroom teachers who were to be involved in the experiments. (Exceptions in this case were the Nebraska and Oklahoma state experiments, where it was not feasible to bring together all the teachers in the rural schools scheduled to receive the telecasts.) In most cases, these workshops developed course outlines, as well as guides for the classroom teachers and, in several instances, guides for the students as well. These workshops proved to be of inestimable value, because in most instances they resulted in courses that were far better prepared than had been true of the same courses in previous years. As a general rule, outside consultants were brought in to offer advice on such matters as curriculum planning and techniques of television teaching. (Such workshops were held again in the summer of 1958, before the start of the second year.)

Physical Facilities: Since today's schools were not designed for television teaching—especially in large classes—one of the

[1] Multilithed copies of a detailed report on the National Program can be obtained without cost by writing to the Fund for the Advancement of Education, 477 Madison Avenue, New York 22, N. Y.

major problems confronting the schools participating in the National Program was how to make provision for classes that were five, ten, or even twenty times the size of conventional classes. This problem was met in various ways. One of the most obvious solutions was to use the school auditorium, which is usually vacant during most of the school day. This approach was the one most commonly used. Some schools were fortunate enough to have fairly modern auditoriums, which could be converted into television classrooms quite readily, but others had to make-do with auditoriums where the acoustics were bad, where the television receiver sets had to be spaced at awkward intervals, and where the seating arrangments left much to be desired, especially when it was necessary for students in one course to make way for students in the next course in a matter of a few minutes. (It should be noted here that there were exceptions to this problem. Visitors to one school in Miami were quite impressed to see an auditorium containing more than 300 students emptied and refilled in two or three minutes, with a minimum of confusion. What made the feat more remarkable was that the students were adolescent eighth-graders.) Lighting in the auditoriums was not much of a problem, since it is not necessary to dim the lights as much for television reception as it is for motion-picture reception. One universal problem with auditoriums, however, was that the armrests were not wide enough for the students to use in taking notes. Several makeshift arrangements were called into play. In some schools, the students were equipped with lapboards, and in others students used their own ingenuity and came equipped with hard-cover notebooks.

Another obvious solution to the problem of finding space for large classes was to use the school cafeteria, which, like the auditorium, is vacant during most of the school day. This approach had its advantages and its disadvantages. On the plus side, the cafeteria tables offered the students a solid surface on which they could rest their notebooks. The tables also made it possible to arrange students into small groups, and in one school this advantage was seized upon to form forty dis-

cussion groups in a class of 200, thereby making possible the equivalent of small seminars in the "follow-up" to the telecast part of the lesson. The major disadvantage of cafeterias as large classrooms were that noises—and odors—from the kitchen were often distracting, and that television receiving sets usually had to be ranged along the walls, which sometimes made for rather odd seating arrangements.

Other approaches to the space problem were tried. Some schools used large study halls, which proved generally satisfactory because they provided desks for the students and permitted a systematic arrangement of the television receiving sets. In other cases, less acceptable arrangements had to be employed. One elementary school, for example, put two portable buildings together to form its large television classroom. This was decidedly not a happy arrangement, but the classroom teacher responded heroically to the situation, and that particular class was mentioned favorably by many people who visited various schools in the National Program.

Class Size: The principal characteristic of all the experiments except the Nebraska and Oklahoma state projects was the large class. At the elementary level, the television classes ranged in size up to 175. At the junior- and senior-high level, they were much larger, ranging in size from 200 to 500.

Most of the elementary schools in the Program were reorganized along the lines of a plan suggested in *Schools for Tomorrow*. Under this plan, students spent half the day in a class of twenty-five students or less, receiving instruction in reading, writing, and arithmetic from a single teacher; the other half of the day they spent in groups of 75 to 150, with a series of teachers, receiving instruction in social studies, science, physical education, health, safety, and other subjects. It was in these larger groups that elementary students in the experiment received part of their instruction over television.

In the junior and senior high schools, the large classes were generally in courses such as history, English, mathematics, physics, and chemistry.

How the Courses Were Taught: In courses in the elementary schools, the classroom teacher usually had about five minutes before the telecast to prepare the students for what they were about to see and hear; the studio teacher then presented the main points of the lesson in a twenty-minute telecast; the classroom teacher then answered questions, stimulated discussion about the points made by the studio teacher, and (depending upon such variables as the general ability level of the class or the complexity of the subject matter that had been presented in the telecast) either reinforced the main points of the lesson or carried the students much beyond what had been presented. Sometimes, of course, a classroom teacher did both. The teacher guides that had been prepared in the summer workshops often contained suggestions for what the classroom teacher might do in the "follow-up" part of the lesson, and in those instances where student guides also had been prepared there were suggestions as to what the student might do on his own to follow up the main points of the lesson.

In courses in the junior and senior high schools, much the same procedure was followed, except that there was much wider variation in the timing of the "follow-up" period. Practice varied so widely that few generalizations are possible, except to say that the televised portion of the lesson was usually about thirty minutes, and the "follow-up" about twenty to twenty-five. Schedules varied so widely that in some instances the "follow-up" came before the telecast, in others it came afterward, and in still others it was divided.

It was customary to have one or more regular classroom teachers present in the viewing room during the entire lesson. In some instances, one classroom teacher handled the entire class. This was most often true at the elementary level. At the junior-high and senior-high levels, the general practice depended a great deal upon subject matter, scheduling, and the size of the class. In some cases, one regular teacher in the particular subject matter of the course (for example, an English teacher) handled the entire class with the assistance of an aide, who took attendance, passed out papers, and performed

other non-professional chores. In other cases, depending largely on the size of the class, two teachers in the particular subject matter were assigned to the class. In still other cases—as when, for example, a class in English was to be followed by a class in history in the same large room—a teacher from each subject-matter area was assigned to both classes. The English teacher would handle the "follow-up" teaching in her course, assisted by the history teacher, and during the history course the roles of the two teachers would be reversed.

Finally, it should be emphasized that no student in the experiment received all of his instruction over television. Even in the Nebraska and Oklahoma experiments, where often there was no teacher present in the viewing room, the televised instruction received by each student represented only a small proportion of the total amount of instruction he received in all classes during the school day.

Evaluation: To assist the participating school systems and the Fund in evaluating the Program, two committees of educators and testing experts were established. The first, known as the Appraisal Committee, was headed by Herold C. Hunt, Eliot Professor of Education at the Harvard Graduate School of Education, and was charged with the responsibility of appraising such things as the quality of instruction, techniques and procedures of teaching large classes, the physical arrangements of the large classes, scheduling problems, and so forth. The second committee, known as the Evaluation Committee, was headed by Arthur E. Traxler, Executive Director of the Educational Records Bureau, and was responsible for advising the participating school systems in the testing of student achievement and attitudes.

In the first year of the study, there was naturally wide variation among the different school systems in the kind and quality of the tests used and in the statistical treatment of the test results. Some schools matched experimental and control groups pupil for pupil, others matched on the basis of means and standard deviations of experimental and control groups, and

still others took differences between the groups into account through analysis of covariance (the procedure favored by the Evaluation Committee).

Although testing and statistical procedures varied widely, *the results presented below are based only on comparisons in which the television and control students had been equated on the basis of scholastic aptitude and pre-test score, or in which differences between television and control groups had been taken into account in such a way that legitimate comparisons could be made.*

Test Results: Despite the newness of television as a medium of instruction, all sorts of technical difficulties, and the makeshift arrangements required to convert auditoriums, cafeterias, large study halls, and portable buildings into classrooms, the test results clearly showed that students who received part of their instruction over television in large classes did as well as—and in many cases significantly better than—students who were taught by conventional methods in small classes.

The results of 110 comparisons cited on page 10 are repeated here: sixty-eight comparisons favored the TV students and forty-two favored the control students. There were thirty-eight cases where the difference in achievement was statistically significant; in twenty-nine of these the difference was in favor of the TV classes, and in nine it was in favor of the control classes.

The table on the following page summarizes the results of the comparisons.

Other Results: Reports from the school systems participating in the National Program indicated that other encouraging results emerged from the first year's experience. For example:

1. The use of television as a medium of instruction in many instances brought about a re-thinking of the curriculum and course objectives.

2. By bringing superior teaching to the attention of a great

NUMBER OF COMPARISONS

	N	In Favor of TV Classes	N	In Favor of Control Classes
Atlanta	2,367	10(6)	2,512	5(2)
Cincinnati	672	5(1)	672	3(0)
Dade County, Fla.	1,856	12(5)	1,435	10(2)
Detroit	1,897	10(6)	1,738	4(1)
Jefferson County, Ky.	1,104	3(2)	1,584	1(0)
Milwaukee	950	2(1)	623	1(0)
Nebraska	568	3(0)	995	4(1)
Norfolk	810	8(5)	850	3(2)
North Carolina	981	3(2)	981	1(0)
Oklahoma City	359	3(0)	284	5(1)
Philadelphia	2,391	9(1)	2,391	5(0)
Totals	14,326	68(29)	12,666	42(9)

Note: "N" signifies the number of TV and control students involved in the comparisons.

Numbers in parentheses indicate cases where the difference in achievement was statistically significant.

many classroom teachers, television proved to be a valuable means of improving the in-service training of teachers.

3. Because of the careful planning that went into televised courses, in many cases they proved much better organized than conventional courses, and the television teachers found they could cover much more ground—and in less time—than they could by conventional methods.

4. Television brought into the classroom far richer educational experiences than had been possible before. (In Philadelphia, for example, the chairman of the U.S. Committee on the International Geophysical Year spoke to several thousand science students on the meaning and significance of the IGY.

In several other cities, rare treasures from museums of art and history were shown to the students over television.)

5. Since all but one of the projects used open-circuit television, the studio teachers had a much wider audience than the students in the classrooms. They found that other school systems were tuning in on their broadcasts and that parents were watching regularly.

6. Much to the surprise of some observers, school librarians reported that the TV students—stimulated by provocative teaching—were making much more extensive use of the library than other students.

7. Several school systems reported substantial savings in teaching positions and in classroom space—with no sacrifice of quality. Dade County, for example, saved the equivalent of twenty-seven teaching positions and twenty-nine classrooms. In other cities, the teacher time saved by the use of television in large classes made it possible to provide much more individualized instruction for slow learners and rapid learners.

8. Tardiness and absences fell off sharply among students in the television classes.

9. Except in a few isolated cases, discipline was not a problem in the large classes.

10. The techniques of teaching and learning in large-class situations have by no means been thoroughly mastered, but the classroom teachers and the students worked hard during the first year to develop and improve them. Classroom teachers experimented with various ways of eliciting student participation, both during and after the televised part of the lesson, and students began to develop the skills of note-taking and of speaking clearly and distinctly in the large classes.

Problems: As might be expected, the school systems participating in the National Program encountered many problems during the first year. Many of these problems had already been encountered in earlier experiments. Some were solved fairly quickly. In general, however, these were the problems that remained unsolved as the Program entered its second year:

1. *The problem of inadequate facilities.* As has been indicated earlier in this report, this was the major problem faced by most of the participating school systems. Auditoriums and cafeterias were not designed for use as classrooms, and they were far from ideal when used for the large television classes. Several school systems, on the basis of their experience during the first year, made alterations to these large rooms in an effort to improve them for classroom use during the 1958-59 school year.

2. *The problem of finding, recruiting, and training studio teachers.* Generally speaking, good classroom teachers make good television teachers, but there are special techniques any teacher must master in using television as a medium of instruction.

3. *The problem of training classroom teachers in the techniques of handling large classes, particularly in the techniques of eliciting student participation.* Discipline has not been a problem in the large classes, but student participation in a large class must of necessity take different forms than is customary in a small class. Several imaginative teachers in the large classes have devised new techniques for stimulating student discussion and involvement after the telecast part of the lesson, but much remains to be learned in this respect.

4. *Students, too, need to learn the techniques of learning in a large-class situation.* Here again, much remains to be learned about the nature of student participation and the various forms it can take.

5. *The problem of integrating the telecast part of the lesson and the classroom "follow-up" into a unified, meaningful whole.* This involves the whole question of the role of the studio teacher and the role of the classroom teacher as members of a teaching team—a question that needs much fuller exploration.

6. *The problem of reorganizing the curriculum to take maximum advantage of television as a teaching tool.* On the basis of the first year's experience, the participating school systems are convinced that the new medium makes possible a much broader, deeper, and richer curriculum than is possible under conventional methods of instruction. The problem is to develop a

curriculum that fully utilizes the potentialities of the new medium.

7. *The problem of adapting the new technique of teaching by television to the varying abilities of students.* This also is a problem in conventional instruction, but it becomes increasingly important when a television teacher reaches several hundred, or several thousand, students in widely scattered classrooms.

8. *The problems of scheduling, with respect to the time of day the lesson is telecast and also with respect to the duration of the telecast and its place in the class period.* The latter aspect of the problem has important implications for the problem of integrating the telecast and the classroom "follow-up" into a meaningful whole.

9. *Finally, there is the never-ending problem of quality.* Television is essentially neutral as a conveyer of ideas, concepts, and information. The quality of the output can only be as good as the quality of the input. A mediocre teacher on television communicates her mediocrity to a much wider audience than a mediocre teacher in a classroom. Generally speaking, the quality of the television teaching in the National Program has been excellent, but the studio teachers themselves are constantly working to make it even better.

The Second Year: All of the participating school systems except one are continuing in the National Program in 1958-59, and most of them have expanded their participation in terms of the number of schools and the number of students. The one exception is Cincinnati, which, without grant support from the Fund or the Foundation, is continuing this year to use televised instruction as a resource in its public schools.

Two new experiments have been added to the National Program this year. In Kansas City, Missouri, three local television stations are each broadcasting a daily half-hour lesson taught by teachers from the Kansas City schools. Three pilot classes are receiving the televised instruction regularly, but any school within range of the station may also participate. The courses

being taught are tenth- and eleventh-grade world history, fifth-grade science, health and safety, and ninth-grade science. The latter course is being taught to a pilot class of eighth-grade students.

The second new experiment in the Program this year involves sixteen school systems in southwestern Indiana, mentioned on page 7, that have formed the Southwestern Indiana Educational Television Council, with headquarters in Evansville. More than 10,000 students in these school systems are receiving televised instruction in fifth-grade science, eighth-grade general science, ninth-grade English literature and grammar, tenth-grade geometry, eleventh-grade U.S. history, and twelfth-grade government, economics, and sociology. This project represents a unique venture by a cluster of adjacent school systems into cooperative planning, financing, and operations.

A Look Ahead

Today the question is no longer *whether* television can play an important role in education. That question has been answered in the affirmative not only by the experiments supported by the Fund and the Foundation but also by the many other programs in which the medium is being used successfully for direct classroom instruction. The question that now needs fuller exploration is *what kind* of a role television can play most effectively.

Under the provisions of the National Defense Education Act of 1958, the Congress of the United States has made available a substantial sum of money for experimentation by schools and colleges in the more effective use of television, radio, motion pictures, and related media for educational purposes. This Act, which is generally regarded as a major landmark in Federal assistance to education, promises to open up many new avenues of exploration into the potential role of television and related media of communication in improving the quality of education in the United States.

Other new developments during the current academic year also point the way toward wider use of television as a medium of instruction. "Continental Classroom," the first course to be televised on a nationwide basis, has already been discussed. The Regents' program in New York State, under which twelve televised courses are being broadcast regularly from a New York City commercial station to schools within a hundred-mile radius of the metropolis, also has important implications for the future role of television in education.

Television can be used—and in some places is being used—to do the traditional job of education, and to do it well. How-

ever, those who have had experience with the medium know that, if wisely and imaginatively used, it also can bring to students educational experiences far beyond what is possible in the conventional classroom. Students in today's classrooms can be eyewitnesses to history in the making. They can have a closeup view of physical and chemical processes that cannot be duplicated in any but the most expensive laboratories—indeed, some that cannot be duplicated in any laboratory. They can see and hear the outstanding scholars of our age. They can have access to the great museums of art, history, and nature. A whole treasure-trove of new and stimulating experiences that were beyond the reach of yesterday's students can be brought into the classroom for today's students.

Also, television makes possible exciting new developments in the team approach to teaching, in which the particular skills and competencies of many teachers are used cooperatively in planning and presenting courses. The status and rewards of teaching can be vastly enhanced by this new medium.

It is important to bear in mind, however, that television is essentially neutral. It can transmit the bad as well as the good, the mediocre as well as the superior. Consequently, it demands the very best of creative, imaginative talent if it is to do its job well.

Television is not a panacea that will cure all the ills of American education or solve all its problems. It has been described, and rightly so, as the most important new educational tool since the invention of movable type, but like the textbook the new medium is essentially just that—a tool. Like any tool, it can be misused or badly used. But if it is wisely and imaginatively used, television can play a major role in broadening and enriching the education of American students at all levels of schooling.

Appendix I

PERSONS TO CONTACT FOR INFORMATION ABOUT TELEVISION EXPERIMENTS

Colleges

Case Institute of Technology

John R. Martin
Professor, Department of Electrical Engineering
Case Institute of Technology
University Circle
Cleveland 6, Ohio

Chicago City Junior College

Clifford G. Erickson
Assistant Dean in Charge of Television Instruction
Chicago City Junior College
3400 North Austin Avenue
Chicago 34, Illinois

University of Detroit

Reverend L. V. Britt, S.J.
Dean, College of Arts and Sciences
University of Detroit
Detroit 21, Michigan

State University of Iowa

Dewey B. Stuit
Dean, College of Liberal Arts
State University of Iowa
Iowa City, Iowa

Miami University

F. G. Macomber
Director, Experimental Study in Instructional Procedures
Miami University
Oxford, Ohio

University of Minnesota

Robert J. Keller
Director, Closed-Circuit Television Project
College of Education
University of Minnesota
Minneapolis 14, Minnesota

University of New Mexico

Tom L. Popejoy
President, University of Mexico
Albuquerque, New Mexico

New York University

Thomas C. Pollock
Dean, Washington Square College of Arts and Sciences
New York University
New York 3, New York

Oregon State Board of Higher Education

Glenn Starlin
Director, Inter-Institutional Television Teaching Project
University of Oregon
Eugene, Oregon

Pennsylvania State University

C. R. Carpenter
Director, Division of Academic Research and Services
Pennsylvania State University
University Park, Pennsylvania

Purdue University

W. L. Ayres
Dean, School of Science, Education and Humanities
Purdue University
Lafayette, Indiana

San Francisco State College

Leo F. Cain
Vice-President
San Francisco State College
1600 Holloway Avenue
San Francisco 27, California

State College of Washington

Vernon Davies
Associate Professor of Sociology
State College of Washington
Pullman, Washington

Stephens College

Ralph C. Leyden
Assistant to the Dean
Stephens College
Columbia, Missouri

Texas Education Agency

J. W. Edgar
Commissioner of Education
Texas Education Agency
Austin, Texas

Schools

Alabama

Edwin L. Williams, Jr.
Coordinator, Alabama Special ETV Project
State Department of Education
State Office Building
Montgomery 4, Alabama

Atlanta Board of Education

Douglas Rumble
Coordinator of Television Project
Station WETV
740 Bismark Road, N. E.
Atlanta 9, Georgia

Chelsea Closed-Circuit Television Project

Lawrence Creshkoff
Director, Chelsea Closed-Circuit Television Project
436 West 27th Street
New York 1, New York

Cincinnati Public Schools

Robert P. Curry
Assistant Superintendent
Department of Instruction
Cincinnati Public Schools
608 East McMillan Street
Cincinnati 6, Ohio

Detroit Public Schools

Elmer F. Pflieger
Coordinator, Television Teaching Project
Detroit Public Schools
9345 Lawton Avenue
Detroit 6, Michigan

Evanston Township High School

Wanda B. Mitchell
Director, TV Teaching Project
Evanston Township High School
1600 Dodge Avenue
Evanston, Illinois

Southwestern Indiana Educational Television Council

Glen H. Traw
Director of TV Project
Carpenter School Building
425 Carpenter Street
Evansville 8, Indiana

Jefferson County Public Schools

Kenneth F. Lam
Director, Jefferson County Educational Television
Hawthorne School
Clarendon and Spencer
Louisville 5, Kentucky

Kansas City Public Schools

Carlotte V. Cunning
TV Project Supervisor
Humboldt School
714 East 11th Street
Kansas City 6, Missouri

Miami Public Schools

Clif Mitchell
Director, ETV Project
Dade County Public Schools
County School Administration Building
275 N. W. Second Street
Miami 36, Florida

Milwaukee Public Schools

Robert R. Suchy
Director of ETV
Milwaukee Public Schools
1111 North 10th Street
Milwaukee, Wisconsin

Nebraska State Department of Education and the University of Nebraska

K. O. Broady
Director, University Extension Division
University of Nebraska
Lincoln 8, Nebraska

New Jersey State Teachers College

E. DeAlton Partridge
President, New Jersey State Teachers College
Montclair, New Jersey

Norfolk City Schools

Grace Johnson
Norfolk City Schools TV Center
Patrick Henry School Building
Colley and Pembroke Avenues
Norfolk 7, Virginia

North Carolina Schools

Charles W. Phillips
Director, North Carolina In-School Television Project
Woman's College
University of North Carolina
Greensboro, North Carolina

Oklahoma City and State Schools

T. H. Broad
Director, Oklahoma City and State ETV Project
Oklahoma City Schools
900 North Klein
Oklahoma City 6, Oklahoma

Philadelphia Public Schools

Martha A. Gable
Director, Radio and Television Education
Board of Public Education
School District of Philadelphia
Parkway at 21st Street
Philadelphia 3, Pennsylvania

Pittsburgh Public Schools and Metropolitan Pittsburgh Educational Television Station

Charles Hettinger
Supervisor of Television Education
Pittsburgh Public Schools
Administration Building
341 South Bellefield Avenue
Pittsburgh 13, Pennsylvania

or

William Dempsey
General Manager
WQED-TV
Fifth and Bellefield
Pittsburgh 13, Pennsylvania

St. Louis Educational Television Commission and St. Louis Public Schools

Earl G. Herminghaus
Research Consultant
Board of Education of the City of St. Louis
1517 South Theresa Avenue
St. Louis 4, Missouri

Schenectady Public Schools

Robert E. Murray
Superintendent
Schenectady Public Schools
108 Union Street
Schenectady, New York

Washington County, Maryland, Public Schools (Hagerstown)

William Brish
Superintendent of Schools
Board of Education of Washington County
Box 730
Hagerstown, Maryland

Wichita Public Schools

Delore Gammon
Assistant Superintendent in Charge of
Elementary Education
Wichita Public Schools
Administration Building
428 South Broadway
Wichita 2, Kansas

Appendix II

COLLEGES AND UNIVERSITIES OFFERING TELEVISED COURSES FOR CREDIT

ALABAMA:

University of Alabama

ARIZONA:

Arizona State College

ARKANSAS:

University of Arkansas

CALIFORNIA:

Chico State College
College of the Pacific
College of Physicians and Surgeons
Compton Junior College
Fresno State College
Humboldt State College
Los Angeles City College
Los Angeles Valley Junior College
Mills College
San Diego State College
San Francisco State College
San Jose State College

COLORADO:

University of Denver

CONNECTICUT:

New Haven State Teachers College

FLORIDA:

University of Florida
University of Miami

GEORGIA:

University of Georgia

ILLINOIS:

Chicago City Junior College
Milliken University
University of Chicago
University of Illinois
Western Illinois University

INDIANA:

Indiana University (Bloomington)
Indiana University (Indianapolis)
Purdue University

IOWA:

Iowa State College
Iowa State Teachers College
State University of Iowa

KANSAS:

Kansas State Teachers College
Southwestern College
University of Kansas
University of Wichita

LOUISIANA:

Louisiana State University

MAINE:

Colby College
University of Maine

MARYLAND:

United States Naval Academy
University of Maryland

MASSACHUSETTS:

Boston University
Endicott Junior College
Massachusetts Institute of Technology
Northeastern University

MICHIGAN:

Central Michigan College
Michigan State University
University of Detroit
University of Michigan
Wayne State University

MINNESOTA:

College of St. Catherine
College of St. Thomas
Gustavus Adolphus College
Macalester College
University of Minnesota

MISSOURI:

St. Louis University
Stephens College
University of Kansas City
Washington University

MONTANA:

College of Great Falls

NEBRASKA:

Nebraska Psychiatric Institute
University of Omaha

NEW JERSEY:

Fairleigh Dickinson University

NEW MEXICO:

University of New Mexico

NEW YORK:

Albany Medical College of Union University
College for Teachers at Albany
New York University
Rensselaer Polytechnic Institute
St. John's University
Syracuse University
Teachers College at Brockport
Teachers College at Oswego
Union College

NORTH CAROLINA:

East Carolina College
University of North Carolina
Woman's College of the University of North Carolina

OHIO:

Case Institute of Technology
Miami University
Ohio State University
Ohio University
University of Cincinnati
University of Toledo
Western Reserve University

OKLAHOMA:

University of Oklahoma

OREGON:

Oregon College of Education
Oregon State College
Oregon Technical Institute
Southern Oregon College of Education
University of Oregon

PENNSYLVANIA:

Duquesne University
Indiana State Teachers College
Lafayette College
Marywood College
Pennsylvania State University
Temple University
University of Pennsylvania
University of Pittsburgh

TENNESSEE:

Fisk University
George Peabody College for Teachers
Siena College
University of Tennessee

TEXAS:

Baylor University
Odessa College
Texas Christian University
Texas Western College
University of Houston
University of Texas

UTAH:

University of Utah

VIRGINIA:

Medical College of Virginia
Union Theological Seminary

WASHINGTON:

Central Washington College
Seattle University
University of Washington

WEST VIRGINIA:

Marshall College
Morris Harvey College

WISCONSIN:

Marquette University
University of Wisconsin (Madison)
University of Wisconsin (Milwaukee)

COLLEGES AND UNIVERSITIES OFFERING CREDIT FOR "CONTINENTAL CLASSROOM"

ALABAMA:

Alabama Polytechnic Institute
Spring Hill College
Talladega College
University of Alabama

ARIZONA:

Arizona State College

ARKANSAS:

Arkansas Agricultural and Mechanical College
Arkansas State College
Henderson State Teachers College
Little Rock University
Southern State College
University of Arkansas

CALIFORNIA:

College of the Pacific
Fresno State College
La Sierra College
Mt. St. Mary's College
Sacramento State College
San Diego State College
San Jose State College
University of California
(Berkeley)
University of Redlands

COLORADO:

Adams State College
Colorado State College
University of Colorado
University of Denver
Western State College of Education

CONNECTICUT:

Danbury State Teachers College
New Haven State Teachers College
Teachers College at New Britain
Willimantic State Teachers College

DISTRICT OF COLUMBIA:

District of Columbia Teachers
College
Howard University

FLORIDA:

Bethune-Cookman College
Florida State University
University of Florida
University of Miami

GEORGIA:

Emory University
Georgia Teachers College
La Grange College
University of Georgia

IDAHO:

Idaho State College

ILLINOIS:

Bradley University
Chicago Teachers College
Eastern Illinois University
Illinois State Normal University
Loyola University
Millikin University
Mundelein College
Northern Illinois University
Quincy College
Rosary College
Saint Xavier College
Western Illinois University

INDIANA:

Ball State Teachers College
Indiana University
Purdue University
St. Francis College

IOWA:

Clarke College
Graceland College
Iowa State College
Iowa State Teachers College
Marycrest College
St. Ambrose College
University of Iowa
Upper Iowa University
Westmar College

KANSAS:

Bethany College
Fort Hays Kansas State College
Kansas State Teachers College
Marymount College
Saint Benedict's College

University of Wichita
Washburn University

KENTUCKY:

Morehead State College
Murray State College
Nazareth College
University of Louisville
Western Kentucky State College

LOUISIANA:

Grambling College
Loyola University

MAINE:

Aroostook State Teachers College
Bates College
Bicker College
Bowdoin College
Colby College
Farmington State Teachers College
Gorham State Teachers College
University of Maine
Washington State Teachers College

MARYLAND:

College of Notre Dame of Maryland
University of Maryland
Western Maryland College

MASSACHUSETTS:

Boston University
College of Our Lady of the Elms
Springfield College

MICHIGAN:

Central Michigan College
Marygrove College
University of Michigan
Wayne State University
Western Michigan University

MINNESOTA:

Gustavus Adolphus College
Macalester College
Mankato State College
Moorhead State College
St. Cloud State College
University of Minnesota

MISSISSIPPI:

Delta State College
Jackson State College
Mississippi College
Tougaloo Southern Christian College
University of Mississippi

MISSOURI:

Central Missouri State College
Culver-Stockton College
Harris Teacher College
Missouri Valley College
Northeast Missouri State Teachers College
Northwest Missouri State College
Rockhurst College
Southwest Missouri State College
William Jewell College

MONTANA:

Eastern Montana College of Education

NEBRASKA:

Creighton University
Midland College
Nebraska State Teachers College

NEVADA:

University of Nevada

NEW HAMPSHIRE:

Plymouth Teachers College

NEW JERSEY:

College of St. Elizabeth
Fairleigh Dickinson University
Montclair State College
Newark State College
Rutgers University

NEW MEXICO:

University of New Mexico

NEW YORK:

Canisius College
College for Teachers at Albany
Cornell University
Manhattanville College of the Sacred Heart
Nazareth College of Rochester
New York University
Notre Dame College of Staten Island
St. John's University
Syracuse University
Teachers College, Columbia University
Teachers College at Oneonta
Teachers College at Oswego
Teachers College at Plattsburgh
University of Buffalo
University of Rochester

NORTH CAROLINA:

Agricultural and Technical College
Bennett College
East Carolina College
Queens College
University of North Carolina
Woman's College of the University of North Carolina

NORTH DAKOTA:

University of North Dakota

OHIO:

Bowling Green State University
Central State College
College of St. Mary of the Springs
Heidelberg College
John Carroll University
Mary Manse College
Notre Dame College
Ohio State University
Ohio Wesleyan University
University of Cincinnati
University of Toledo
Ursuline College for Women
Wittenberg College
Xavier University
Youngstown University

OKLAHOMA:

Central State College
East Central State College
Oklahoma State University
Phillips University
University of Tulsa

OREGON:

Cascade College
Lewis and Clark College
Oregon College of Education
Oregon State College
University of Oregon
University of Portland

PENNSYLVANIA:

King's College
Marywood College
Misericordia College
Pennsylvania State University
St. Vincent College
State Teachers College at Bloomsburg

State Teachers College at Millersville
State Teachers College at Shippensburg
State Teachers College at West Chester
University of Pittsburgh
University of Scranton
Ursinus College

SOUTH CAROLINA:

Furman University

SOUTH DAKOTA:

Augustana College
Southern State Teachers College

TENNESSEE:

East Tennessee State College
King College
Memphis State University
Middle Tennessee State College
University of Chattanooga
University of Tennessee

TEXAS:

Abilene Christian College
Baylor University
Bishop College
Hardin-Simmons University
McMurray College
Prairie View Agricultural and Mechanical College
St. Mary's University
Sam Houston State College
Southwest Texas State Teachers College
Stephen Austin State College
Texas Christian University
Texas Technological College
Trinity University
University of Texas
West Texas State College

UTAH:

Brigham Young University
University of Utah

VIRGINIA:

Hampton Institute
Longwood College
Madison College
University of Virginia
Virginia State College
William and Mary College

WASHINGTON:

Central Washington College of Education
College of Puget Sound
Eastern Washington College of Education
Pacific Lutheran College
Seattle Pacific College
Seattle University
University of Washington
Western Washington College of Education
Whitworth College

WEST VIRGINIA:

Fairmont State College
Marshall College
West Liberty State College

WISCONSIN:

Beloit College
Northland College
St. Norbert College
Wisconsin State College (River Falls)
Wisconsin State College (Superior)

SCHOOL DISTRICTS (OR SCHOOLS) MAKING REGULAR USE OF TELEVISED INSTRUCTION

ALABAMA:

Alexander
Andalusia
Anniston
Autauga County
Barbour County
Bessemer
Birmingham
Butler County
Calhoun County
Chambers County
Cherokee County
Cleburne County
Coffee County
Coosa County
Covington County
Crenshaw County
Cullman
Cullman County
Dale County
DeKalb County
Elmore County
Enterprise
Escambia County
Fairfield
Gadsden
Houston County
Jacksonville
Jefferson County
Lanett
Lee County
Lowndes County
Macon County
Marshall County
Monroe County
Montgomery County
Opelika
Opp
Ozark
Pike County
Randolph County
Roanoke
Russell County
St. Clair County
Selma
Shelby County
Sylacauga
Talladega
Talladega County
Tallapoosa County
Tallassee
Tarrant
Troy
Tuscaloosa
Tuscaloosa County
Wilcox County

ARIZONA:

West Phoenix High School

CALIFORNIA:

Alvarado
Alviso
Berkeley
Berryessa
Carlsbad
Castro Valley
Cupertino
Dixie
Emery
Fremont
Hayward
Healdsburg

Hillsborough
Independent
Irvington
Livermore
Loma Prieta
Los Altos
Mill Valley
Mt. Eden
Novato
Oak Grove
Oakland City
Old Adabe
Palo Alto
Palomares
Penngrove
Pinole-Hercules
Pleasanton (and Amador Valley)
Redwood City
Richmond
Rucker Elementary School
San Anselmo
San Carlos
San Diego
San Francisco
San Jose (Marin County)
San Jose (Santa Clara County)
San Leandro
San Lorenzo
San Mateo
San Pablo
San Rafael
Sequoia
Sheldon
Sonoma Valley
Vallejo
Warm Springs

DELAWARE:

Harrington
Seaford

DISTRICT OF COLUMBIA

FLORIDA:

Dade County
Hernando County
Hillsborough County
Manatee County
Pasco County
Pinellas County
Polk County
Sarasota County

GEORGIA:

Atlanta
Fulton County

ILLINOIS:

Belleville
Caseyville
Chicago
East St. Louis
Evanston Township High School
Godfrey
Granite City
Hartford
Highland
Millstadt
O'Fallon

INDIANA:

Boonville
Cannelton
Clarksville
Evansville
Floyd County
Huntingburg

INDIANA: *(Continued)*

Jasper
Jeffersonville
Mt. Vernon
New Albany
Newburgh
New Harmony
Oakland City
Petersburg
Posey County
Princeton
Rockport
Tell City
Vincennes
Washington

IOWA:

Des Moines

KANSAS:

Lawrence
Wichita

KENTUCKY:

Jefferson County
Louisville

LOUISIANA:

De La Salle High School
(New Orleans)

MARYLAND:

Calvert County
Caroline County
Charles County
Maryland State Teachers
College Campus School
(Salisbury)
Montgomery County
Prince Georges County
St. Marys County
Somerset County
Washington County
Wicomico County
Worcester County

MASSACHUSETTS:

Abington
Arlington
Ashland
Avon
Barre
Bellingham
Belmont
Beverly
Boston
Braintree
Bridgewater
Brookline
Burlington
Cambridge
Chelsea
Cohasset
Concord
Dedham
Douglas
Dover
Duxbury
Essex
Everett
Falmouth
Foxboro
Franklin
Granville
Halifax
Hanover
Hansen
Hopedale
Hubbardston
Hull
Kingston

Lexington
Littleton
Lynnfield
Malden
Manchester
Mansfield
Marblehead
Maynard
Medfield
Medford
Melrose
Menden
Middleboro
Middleton
Milton
Nahant
Natick
Needham
New Bedford
Newton
North Andover
Northbridge
Norton
Norwell
Norwood
Peabody
Pembroke
Petersham
Plainville
Plymouth
Plympton
Reading
Revere
Rockland
Salem
Sharon
Sherborne
Somerville
Stoneham
Stoughton
Sudbury
Sutton
Townsend
Uxbridge
Wakefield
Walpole
Waltham
Wayland
Wellesley
West Bridgewater
Weston
Westwood
Weymouth
Whitman
Wilmington
Winchester
Winthrop
Wrentham

MICHIGAN:

Allen Park
Birmingham
Dearborn
Detroit
Grosse Point
Highland Park
Roseville
Trenton

MINNESOTA:

Minneapolis

MISSOURI:

Affton
Berkely
Brentwood
Clayton
Eureka
Ferguson
Jefferson Barracks
Jennings

MISSOURI: *(Continued)*

Kansas City
Kirkwood
Ladue
Maplewood
Mehlville
Normandy
Pattonville
Ritenour
Riverview Gardens
St. Charles
St. Louis
University City
Warrensburg
Webster Groves
Wellston
West Walnut Manor

NEBRASKA:

Adams
Barneston
Beatrice
Beaver Crossing
Bellwood
Bennet
Ceresco
Clatonia
Crete
DeWitt
Douglas
Eagle
Friend
Gretna
Homesville
Lincoln
Martell
Palmyra
Prague
Raymond
Syracuse
Thayer
Wahoo
Walton
Waverly
Weeping Water
Western
Wilber
York

NEW HAMPSHIRE:

Atkinson
Hampstead
Hampton
Hampton Falls
Keene
New Castle
North Hampton
Seabrook
South Hampton

NEW MEXICO:

Albuquerque

NEW YORK:

Bellerose
Cortland
Levittown
Maryvale High School
(Cheektowaga)
New York City
Schenectady

NORTH CAROLINA:

Alamance County
Albemarle
Anson County
Asheville
Beaufort County
Bladen County
Brunswick County
Charlotte

Chatham County
Cherryville
Clinton
Columbus County
Craven County
Davidson County
Durham
Durham County
Elkin
Fairmont
Fayetteville
Forsythe County
Franklin County
Franklinton
Goldsboro
Granville County
Greene County
Greensboro
Greenville
Guilford County
Harnett County
Hickory
High Point
Hyde County
Iredell County
Johnston County
Jones County
Kings Mountain
Kinston
Laurinburg
Lee County
Lenoir County
Lincolnton
Madison
Martin County
Maxton
Mecklenburg County
Monroe
Montgomery County
Moore County
Mount Airy
New Bern
New Hanover County
Northampton County
Onslow County
Orange County
Oxford
Pender County
Person County
Pinehurst
Pitt County
Raleigh
Randolph County
Red Springs
Roanoke Rapids
Rockingham
Rockingham County
Rocky Mount
Salisbury
Sanford
Shelby
Southern Pines
Stanly County
Stokes County
Surry County
Tarboro
Union County
Wake County
Warren County
Washington
Washington County
Watauga County
Wilson County
Winston-Salem
Yadkin County

OHIO:

Cincinnati
Columbus

OKLAHOMA:

Alex
Anadarko
Billings
Boley
Chandler
Crescent
Dibble
Dover
Drummond
Earlsboro
Edmond
Garber
Glencoe
Harrah
Hayward
Hinton
Hitchcock
Kingfisher
Konawa
Loco
Lookeba
Loyal
Luther
Marshall
Maud
Meeker
Minco
Morrison
Mulhall
Mustang
Newcastle
Noble
Okarche
Oklahoma City
Orlando
Perkins
Piedmont
Pocasset
Purcell
Red Rock
Seminole
Stratford
Tryon
Washington
Wayne
Weleetka
Wellston

PENNSYLVANIA:

Abington
Aliquippa Borough
Allegheny Valley Joint Schools
Ambridge
Aspinwall
Avonworth Union
Baldwin-Whitehall
Bellevue
Bethel Borough
Braddock
Brentwood
Butler Area Joint Schools
Carnegie Borough
Carroll Township
Castle Shannon Borough
Chalfant Borough
Charleroi
Chartiers Valley Joint Schools
Clairton
Corapolis Borough
Dormont
Dravosburg Borough
East Deer-Frazer Union
East Washington
Elizabeth-Forward Joint Schools
Fawn Township
Forest Hills Borough
Fox Chapel
Greensburg
Greentree Borough
Hampton Township
Har-Brack Joint School District

Hemfield Area Joint Schools
Homestead
Hopewell-Independence-Racoon Joint Schools
Indiana Borough
Ingram
Liberty Borough
McKeesport
Midland
Monaca Area Schools
Monongahela
Monroeville-Pitcairn Joint School District
Mount Lebanon
Mount Oliver Borough
Munhall
Narberth
Neville Township
New Castle
New Kensington
North Allegheny Joint Schools
North Hills Joint School District
North Versailles Township
Penn-Trafford Joint Schools
Peters Township
Philadelphia
Pittsburgh
Plum Borough
Port Vue Borough
Reserve Township
Rosslyn Farms Borough
Salem Township
Shaler Township
Snowden Township
Stowe Township
Thornburg Borough
Turtle Creek
Verona Borough
Versailles Borough
Versailles Township
West Allegheny Joint Schools
West Jefferson Hills
West Mifflin Borough
West Newton
Whitaker Borough
Wilkins Township
Wilkinsburg
Worthington-West Franklin

SOUTH CAROLINA:

Chesterfield County
Darlington County
Dillon County
Florence County
Horry County
Marion County
Marlboro County
Spartanburg
Williamsburg County
York

TENNESSEE:

Johnson City

TEXAS:

Snyder

VIRGINIA:

Accomack County
Alexandria
Arlington
Danville
Fairfax County
Falls Church
Fort Myer
Fredericksburg
Loudoun
Norfolk
Prince William County

WISCONSIN:

Milwaukee

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JAMES F. BROWNLEE, Chairman of the Board, Minute Maid Corporation
JOHN COWLES, President, Minneapolis Star and Tribune Company
MARK F. ETHRIDGE, Publisher, The Louisville Courier-Journal
BENSON FORD, Vice President, Ford Motor Company
HENRY FORD II, President, Ford Motor Company
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LAURENCE M. GOULD, President, Carleton College
HENRY T. HEALD, President, The Ford Foundation
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JULIUS A. STRATTON, President, Massachusetts Institute of Technology
CHARLES E. WYZANSKI, JR., Judge, United States District Court

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PHILIP H. COOMBS, *Secretary*
LESTER W. NELSON, *Treasurer*

* In January, 1957, Mr. Faust became a Vice President of the Ford Foundation in charge of its Education program. In May, 1958, Mr. Eurich was appointed Executive Director of the Foundation's Education program, Mr. Coombs was appointed Program Director, and Mr. Nelson an Associate Program Director. All four officers will continue with their present duties with the Fund for the Advancement of Education, helping to coordinate its activities with the Foundation's under the remainder of the $25 million grant to the Fund in 1954.

The following publications are currently available without charge on request from the FORD FOUNDATION, Office of Reports, 477 Madison Avenue, New York 22, N.Y.

THE FORD FOUNDATION ANNUAL REPORT

ABOUT THE FORD FOUNDATION: A brief account of the program activities of the Ford Foundation.

CHARTER AND BYLAWS OF THE FORD FOUNDATION

MENTAL HEALTH, A FORD FOUNDATION REPORT: A description of an illustrative group of research programs supported through the Foundation's concluded $13 million program of grants in mental health.

PAKISTAN: A pictorial report of the Foundation's program in Pakistan.

THE DIFFERENCE IT MAKES: A description of some of the ways in which hospitals are using funds received under the Foundation's concluded $200 million hospital program to expand and improve their services.

THE FORD FOUNDATION AND ST. LOUIS: The story of the Foundation's assistance to civic and educational progress in a representative American community.

THE FORD FOUNDATION PROGRAM IN HUMANITIES AND THE ARTS: The objectives, methods, and initial grants of the Foundation's program in humanistic scholarship and the creative arts.

THE GOOD SEED: A report on several Foundation activities concerned with problems of American education.

STATE AND REGIONAL BOOKLETS: Summaries of Foundation grants in Alabama, Alaska, California, Florida, Georgia, Idaho, Illinois, Iowa, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Montana, Nebraska, Nevada, New York, North Dakota, Oregon, South Dakota, Tennessee, Utah, Washington, Wisconsin, and Wyoming. Booklets on remaining states are in preparation.

The following publications are currently available without charge on request from the FUND FOR THE ADVANCEMENT OF EDUCATION, 477 Madison Avenue, New York 22, New York.

A REPORT FOR 1954-56.

BETTER UTILIZATION OF COLLEGE TEACHING RESOURCES. A report by the Committee on Utilization of College Teaching Resources.

NEW DIRECTIONS IN TEACHER EDUCATION, Paul Woodring. An interim report of the work of the Fund for the Advancement of Education in the areas of teacher education and recruitment.

SCHOOLS FOR TOMORROW: AN EDUCATOR'S BLUEPRINT, Alexander J. Stoddard. A survey of the possible uses of television in primary and secondary schools.

TEACHING SALARIES THEN AND NOW, A 50-YEAR COMPARISON WITH OTHER OCCUPATIONS AND INDUSTRIES, Beardsley Ruml and Sidney G. Tickton. Bulletin Number 1.

THE GRADUATE SCHOOL TODAY AND TOMORROW: REFLECTIONS FOR THE PROFESSION'S CONSIDERATION, F. W. Strothmann. Report written on behalf of the Committee of Fifteen.

THE ROLE OF EDUCATION IN AMERICAN HISTORY, Paul H. Buck, Clarence H. Faust, Richard Hofstadter, Arthur M. Schlesinger, and Richard J. Storr.

THEY WENT TO COLLEGE EARLY. A report on the Early Admission to College Program.